

**REPORT NUMBER: SNCAP-MGA-2009-007**

**VALIDATION  
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST**

**FORD MOTOR COMPANY  
2010 FORD MUSTANG 2-DR COUPE  
NHTSA NUMBER: MA0205**

**PREPARED BY:  
MGA RESEARCH CORPORATION  
5000 WARREN ROAD  
BURLINGTON, WI 53105**



**Test Date: April 29, 2009**

**Report Date: August 28, 2009**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
1200 NEW JERSEY AVENUE, SE  
ROOM W43-410  
WASHINGTON, D.C. 20590**

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Prepared by:   
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Approval Date: August 28, 2009

FINAL REPORT ACCEPTANCE BY OCWS:

\_\_\_\_\_  
Division Chief, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

\_\_\_\_\_  
COTR, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

### Technical Report Documentation Page

| 1. Report No.<br>SNCAP-MGA-2009-007                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2. Government Accession No.                          | 3. Recipient's Catalog No.                                                                                                                                                                           |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
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| 4. Title and Subtitle<br>Final Report of Validation Testing<br>Side Impact Testing of 2010 Ford Mustang 2-Dr Coupe<br>NHTSA No.: MA0205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      | 5. Report Date<br>August 28, 2009                                                                                                                                                                    |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
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| 7. Author(s)<br>Donna Janovicz, Program Manager<br>Ben Fischer, Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                      | 8. Performing Organization Report No.<br>SNCAP-MGA-2009-007                                                                                                                                          |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| 9. Performing Organization Name and Address<br>MGA Research Corporation<br>5000 Warren Road<br>Burlington, WI 53105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                      | 10. Work Unit No.                                                                                                                                                                                    |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
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| 12. Sponsoring Agency Name and Address<br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Crashworthiness Standards<br>1200 New Jersey Ave, SE, Room W43-410<br>Washington, D.C. 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      | 13. Type of Report and Period Covered:<br>Final Test Report<br>4/29/2009 to 8/28/2009                                                                                                                |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
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| 15. Supplementary Notes<br>Validation Testing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                      |                                                                                                                                                                                                      |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| 16. Abstract<br>A 55/28 km/h 90° Moving Deformable Barrier NCAP Side Validation Test was conducted on the subject 2010 Ford Mustang 2-Dr Coupe in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at MGA Research Corporation, in Burlington, Wisconsin, on April 29, 2009.<br><br>The impact velocity of the Moving Deformable Barrier (MDB) was 62.3 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle post test maximum crush was 206 mm at level 2. The test vehicle's occupant performance was as follows: <div style="margin-top: 10px;"> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td>N/A</td> <td>1000</td> <td>73</td> </tr> <tr> <td>Maximum Thorax Rib Deflection</td> <td>mm</td> <td>44</td> <td>43</td> </tr> <tr> <td>Combined Abdominal Force</td> <td>N</td> <td>2500</td> <td>917</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>2069</td> </tr> </tbody> </table> <br/> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td>N/A</td> <td>1000</td> <td>2735</td> </tr> <tr> <td>Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>62</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2864</td> </tr> </tbody> </table> </div> |                                                      |                                                                                                                                                                                                      |           |  | Driver ATD (ES-2re) |  |  | Measurement Description | Units | Threshold | Result | Head Injury Criteria (HIC <sub>36</sub> ) | N/A | 1000 | 73 | Maximum Thorax Rib Deflection | mm | 44 | 43 | Combined Abdominal Force | N | 2500 | 917 | Pubic Symphysis Force | N | 6000 | 2069 |  | Passenger ATD (SID-IIs) |  |  | Measurement Description | Units | Threshold | Result | Head Injury Criteria (HIC <sub>36</sub> ) | N/A | 1000 | 2735 | Lower Spine Acceleration | G | 82 | 62 | Total Pelvic Force (sum of acetabular and iliac forces) | N | 5525 | 2864 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Driver ATD (ES-2re)                                  |                                                                                                                                                                                                      |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Measurement Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Units                                                | Threshold                                                                                                                                                                                            | Result    |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Head Injury Criteria (HIC <sub>36</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                  | 1000                                                                                                                                                                                                 | 73        |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Maximum Thorax Rib Deflection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | mm                                                   | 44                                                                                                                                                                                                   | 43        |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Combined Abdominal Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | N                                                    | 2500                                                                                                                                                                                                 | 917       |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Pubic Symphysis Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | N                                                    | 6000                                                                                                                                                                                                 | 2069      |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
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| Measurement Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Units                                                | Threshold                                                                                                                                                                                            | Result    |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Head Injury Criteria (HIC <sub>36</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                  | 1000                                                                                                                                                                                                 | 2735      |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Lower Spine Acceleration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | G                                                    | 82                                                                                                                                                                                                   | 62        |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| Total Pelvic Force (sum of acetabular and iliac forces)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | N                                                    | 5525                                                                                                                                                                                                 | 2864      |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| 17. Key Words<br>Validation Testing<br>Side Impact<br>MDB<br>ES-2re<br>SID-IIs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      | 18. Distribution Statement<br>Copies of this report are available from:<br>National Highway Traffic Safety Adm.<br>Technical Reference Division<br>1200 New Jersey Ave, SE<br>Washington, D.C. 20590 |           |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |
| 19. Security Classif. (of this report)<br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20. Security Classif. (of this page)<br>Unclassified | 21. No. of Pages<br><br>183                                                                                                                                                                          | 22. Price |  |                     |  |  |                         |       |           |        |                                           |     |      |    |                               |    |    |    |                          |   |      |     |                       |   |      |      |  |                         |  |  |                         |       |           |        |                                           |     |      |      |                          |   |    |    |                                                         |   |      |      |

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## **SECTION 1**

### **PURPOSE AND SUMMARY OF TEST**

#### **PURPOSE**

This moving deformable barrier side impact test is part of the NCAP Side Validation Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-12005. The purpose of this test is to generate comparative side impact performance in a 2010 Ford Mustang 2-Dr Coupe. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated April 2009.

#### **SUMMARY**

A 2010 Ford Mustang 2-Dr Coupe was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.3 km/h (38.7 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on April 29, 2009. Pretest and post test photographs of the test vehicle, the MDB, and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated April 2009. The side impact event was documented by eleven (11) cameras. Camera locations are included in this report.

The dummies were instrumented in the following manner:

##### **DRIVER ATD (ES-2re)**

- Head Accelerometers
- Thorax Rib 1 to Rib 3 Potentiometers
- Abdomen Forward, Middle, and Rear Load Cells
- Lower Spine Accelerometers
- Pubic Load Cell

##### **PASSENGER ATD (SID-IIs)**

- Head Accelerometers
- Upper Neck Load Cells
- Shoulder Displacement Potentiometer
- Thorax Upper, Middle, and Lower Rib Potentiometers
- Abdomen Upper and Lower Rib Potentiometers
- Lower Spine Accelerometers
- Iliac Load Cell
- Acetabulum Load Cell

### DUMMY INJURY VALUES

| Measurement Description                   | Driver ATD (ES-2re) |           |        |
|-------------------------------------------|---------------------|-----------|--------|
|                                           | Units               | Threshold | Result |
| Head Injury Criteria (HIC <sub>36</sub> ) | N/A                 | 1000      | 73     |
| Maximum Thorax Rib Deflection             | mm                  | 44        | 43     |
| Combined Abdominal Force                  | N                   | 2500      | 917    |
| Pubic Symphysis Force                     | N                   | 6000      | 2069   |

| Measurement Description                                 | Passenger ATD (SID-IIs) |           |        |
|---------------------------------------------------------|-------------------------|-----------|--------|
|                                                         | Units                   | Threshold | Result |
| Head Injury Criteria (HIC <sub>36</sub> )               | N/A                     | 1000      | 2735   |
| Lower Spine Acceleration                                | G                       | 82        | 62     |
| Total Pelvic Force (sum of acetabular and iliac forces) | N                       | 5525      | 2864   |

### SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

| Restraint Type                | Left Front Driver |                                 | Left Rear Passenger |          |
|-------------------------------|-------------------|---------------------------------|---------------------|----------|
|                               | Installed         | Deployed                        | Installed           | Deployed |
| Front Airbag                  | Yes               | No                              | No                  |          |
| Knee Airbag                   | No                |                                 | No                  |          |
| Side Torso Airbag             | No                |                                 | No                  |          |
| Head/Torso Airbag             | Yes               | Yes (see<br>(general comments)) | No                  |          |
| Side Head Curtain/Tube Airbag | No                |                                 | No                  |          |
| Pretensioner                  | Yes               | Yes                             | No                  |          |
| Load Limiter                  | Yes               | No                              | No                  |          |

The test data can be found on the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

### GENERAL COMMENTS

The driver combo airbag did not fully deploy. There was no protection to the driver head. See Photos on pages A-38 and A-39.

There was no valid data collected for:

- Passenger Head X, Y, Z Redundant after 70 msec.
- Driver Seat Track Y after 40 msec.
- Left Front Sill Y
- Left Lower B-Post Y
- Left Mid B-Post Y

The following accelerometers were not used:

- Driver Lower Spine X, Z
- Passenger Lower Spine X, Z
- Front Door Centerline
- Front Door Mid-Rear
- Front Door Upper Centerline
- Rear Door Mid-Rear
- Rear Door Upper Centerline

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes.

**SECTION 2**  
**OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS**

## DATA SHEET NO. 1

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

### TEST VEHICLE INFORMATION AND OPTIONS

|                                                                            |                     |                                |     |
|----------------------------------------------------------------------------|---------------------|--------------------------------|-----|
| NHTSA No.                                                                  | MA0205              | Anti-Lock Brakes               | Yes |
| Model Year                                                                 | 2010                | All Wheel Drive                | No  |
| Make                                                                       | Ford                | Power Steering                 | Yes |
| Model                                                                      | Mustang             | Driver Front Airbag            | Yes |
| Body Style                                                                 | Coupe               | Driver Side Torso Airbag       | No  |
| VIN                                                                        | 1ZVBP8AN5A5108385   | Driver Side Head Airbag        | No  |
| Body Color                                                                 | Grabber Blue        | Driver Curtain Airbag          | No  |
| Delivery Date                                                              | 4/24/2009           | Driver Knee Airbag             | No  |
| Odometer (km/mi)                                                           | 92 km / 57 mi       | Driver Head/Torso Combo Airbag | Yes |
| Dealer                                                                     | Boucher Fleet Group | Rear Pass. Front Airbag        | No  |
| Transmission                                                               | Automatic           | Rear Pass. Side Torso Airbag   | No  |
| Final Drive                                                                | Rear                | Rear Pass. Side Head Airbag    | No  |
| Type/No. Cylinders                                                         | V6                  | Rear Pass. Curtain Airbag      | No  |
| Engine Displacement (L)                                                    | 4.0                 | Rear Pass. Combo Airbag        | No  |
| Engine Placement                                                           | Longitudinal        | Pretensioners                  | Yes |
| Roof Rack                                                                  | No                  | Load Limiters                  | Yes |
| Sunroof/T-Top                                                              | No                  | Air Conditioning               | Yes |
| Tinted Glass                                                               | No                  | AM/FM CD                       | Yes |
| Traction Control                                                           | Advancetrac w/ESC   | Tilt Steering                  | Yes |
| Power Brakes                                                               | Yes                 | Automatic Door Locks           | Yes |
| Front Disc                                                                 | Yes                 | Power Windows                  | Yes |
| Rear Disc                                                                  | Yes                 | Power Seats                    | No  |
| Does owner's manual provide instructions to turn off automatic door locks? | Yes                 |                                |     |

### DATA FROM CERTIFICATION LABEL

|                     |                    |                 |      |
|---------------------|--------------------|-----------------|------|
| Manufactured By     | Ford Motor Company | GVWR (kg)       | 2059 |
| Date of Manufacture | 04/09              | GAWR Front (kg) | 993  |
|                     |                    | GAWR Rear (kg)  | 1070 |

### VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

| Measured Parameter                | Front | Rear | Third | Total |       |
|-----------------------------------|-------|------|-------|-------|-------|
| Designated Seating Capacity (DSC) | 2     | 2    |       | 4     | (A)   |
| Capacity Wt. (VCW) (kg)           |       |      |       | 326   | (B)   |
| DSC x 68.04 (kg)                  |       |      |       | 272   | (A-B) |
| Cargo Wt. (RCLW) (kg)             |       |      |       | 54    |       |

### VEHICLE SEAT TYPE

|                  | Type of Seat Pan |       |             |           | Type of Seat Back |            |         |
|------------------|------------------|-------|-------------|-----------|-------------------|------------|---------|
| Seating Location | Bucket           | Bench | Split Bench | Contoured | Fixed             | Adjustable |         |
|                  |                  |       |             |           |                   | w/ Lever   | w/ Knob |
| Front Seat       | X                |       |             |           |                   | X          |         |
| Rear or Second   | X                |       |             |           | X                 |            |         |
| Third Row Seat   |                  |       |             |           |                   |            |         |

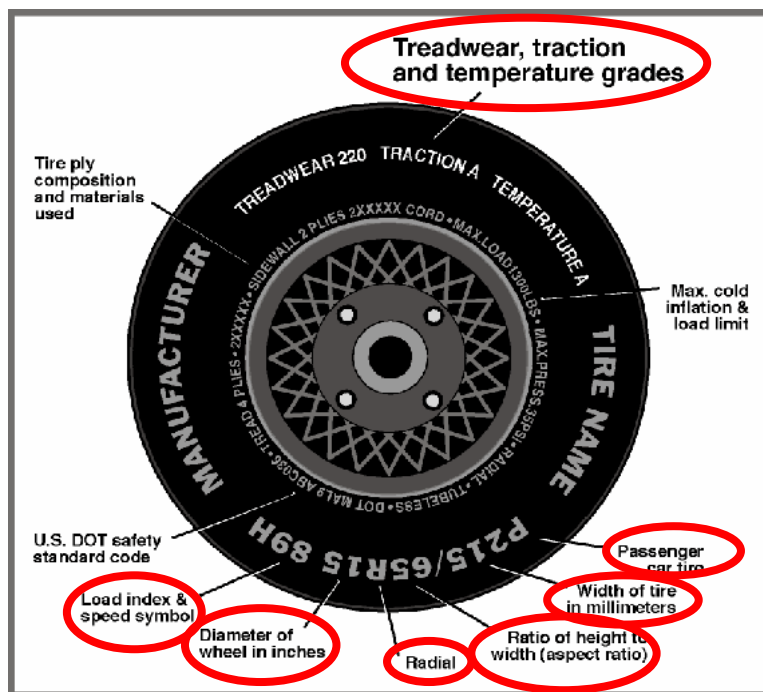
## DATA SHEET NO. 1 (continued)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

### VEHICLE TIRE INFORMATION



### DATA FROM TIRE PLACARD

| Measured Parameter          | Front        | Rear         |
|-----------------------------|--------------|--------------|
| Maximum Tire Pressure (kPa) | 300          | 300          |
| Cold Pressure (kPa)         | 220          | 220          |
| Recommended Tire Size       | P215/60R17   | P215/60R17   |
| Tire Size on Vehicle        | P215/60R17   | P215/60R17   |
| Tire Manufacturer           | BF Goodrich  | BF Goodrich  |
| Tire Model                  | Traction T/A | Traction T/A |
| Treadwear                   | 620          | 620          |
| Traction                    | A            | A            |
| Temperature Grades          | B            | B            |
| Tire Plies Sidewall         | 1            | 1            |
| Tire Plies Body             | 4            | 4            |
| Load Index & Speed Symbol   | 95T          | 95T          |
| Tire Material               | Rubber       | Rubber       |
| DOT Safety Code Left        | APNV         | APNV         |
| DOT Safety Code Right       | APNV         | APNV         |

## DATA SHEET NO. 1 (continued)

### GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

### TEST VEHICLE WEIGHTS

|        | Units | As Delivered (UVW) |       |        | As Tested (ATW) (Axle) |       |        | Fully Loaded |       |        |
|--------|-------|--------------------|-------|--------|------------------------|-------|--------|--------------|-------|--------|
|        |       | Front              | Rear  | Total  | Front                  | Rear  | Total  | Front        | Rear  | Total  |
| Left   | kg    | 421.4              | 358.8 |        | 455.9                  | 433.2 |        | 462.7        | 431.4 |        |
| Right  | kg    | 427.7              | 362.4 |        | 428.2                  | 428.6 |        | 434.5        | 425.5 |        |
| Ratio  | %     | 54.1               | 45.9  |        | 50.6                   | 49.4  |        | 51.1         | 48.9  |        |
| Totals | kg    | 849.1              | 721.2 | 1570.3 | 884.1                  | 861.8 | 1745.9 | 897.2        | 856.9 | 1754.1 |

### TARGET TEST WEIGHT CALCULATION

| Measured Parameter                           | Units | Value  |         |
|----------------------------------------------|-------|--------|---------|
| Total Delivered Weight (UVW)                 | kg    | 1570.3 | (A)     |
| Sum of Actual Weight of 2 P572 ATDs Used     | kg    | 129.3  | (B)     |
| Rated Cargo/Luggage Weight (RCLW)            | kg    | 54     | (C)     |
| Calculated Target Vehicle Test Weight (TVTW) | kg    | 1753.6 | (A+B+C) |

### TEST VEHICLE ATTITUDES AND CG

|                                                        | Units | LF  | RF  | LR  | RR  | CG (aft of front axle) |
|--------------------------------------------------------|-------|-----|-----|-----|-----|------------------------|
| Fully Loaded                                           | mm    | 709 | 712 | 713 | 721 |                        |
| As Tested (Fully Loaded $\pm$ 10mm at each wheel well) | mm    | 710 | 704 | 716 | 719 | 1343                   |

### GENERAL TEST VEHICLE DATA

| Measurement Description                 | Units | Value |
|-----------------------------------------|-------|-------|
| Total Vehicle Wheel Base                | mm    | 2720  |
| Total Vehicle Length at Left Side       | mm    | 4161  |
| Total Vehicle Length at Centerline      | mm    | 4768  |
| Total Vehicle Length at Right Side      | mm    | 4161  |
| Weight of Ballast in Cargo Area         | kg    | 11.8  |
| Weight of Vehicle Components Removed    | kg    | 18.6  |
| Amount of Stoddard Solvent in Fuel Tank | L     | 56.9  |

Vehicle components removed to meet Test Weight: Spare tire, tools, trunk carpet, right rear window, and taillight.

### TEST VEHICLE VERTICAL IMPACT LINE DATA

| Measurement Description               | Units | Value |
|---------------------------------------|-------|-------|
| Target Impact Point Aft of Front Axle | mm    | 420   |
| Actual Impact Point Aft of Front Axle | mm    | 411   |

## DATA SHEET NO. 2

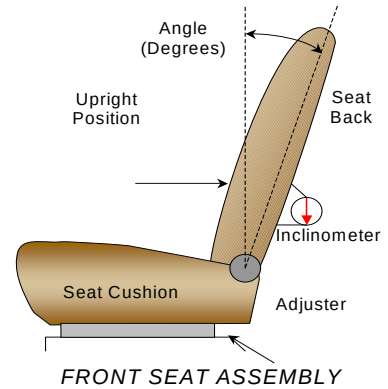
### SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
Test Program: Side Validation Testing

NHTSA No. MA0205  
Test Date: 4/29/2009

#### NORMAL DESIGN RIDING POSITION

The driver and passenger seat backs are positioned to the manufacturer's designated angle. The procedure is as follows:  
For the driver seat, set at 13 degrees using the headrest post.  
The left rear passenger seat is fixed.



#### SEAT BACK ANGLES

|                             | Degrees               |
|-----------------------------|-----------------------|
| Driver with Seated Dummy    | 13.9 at headrest post |
| Passenger with Seated Dummy | Fixed                 |

#### SEAT FORE/AFT POSITIONS

|             | Total Fore/Aft Travel | Placed in Position # |
|-------------|-----------------------|----------------------|
| Driver Seat | 237 mm                | 119 mm               |
| Rear Seat   | Fixed                 | Fixed                |

Describe method: Using only the controls that primarily move the seat in the fore-aft direction, the seat was placed in the full rear position. The seat was moved forward marking each detent position until the forwardmost position was reached. The seat was placed in the mid point of travel or next rearward locking detent.

#### SEAT BELT UPPER ANCHORAGES

|             | Total # of Positions | Placed in Position # |
|-------------|----------------------|----------------------|
| Driver Seat | Fixed                | Fixed                |
| Rear Seat   | Fixed                | Fixed                |

Describe method: The anchorages were non-adjustable.

## DATA SHEET NO. 2 (CONTINUED)

### SEAT ADJUSTMENT, FUEL SYSTEMS, AND STEERING WHEEL DATA

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

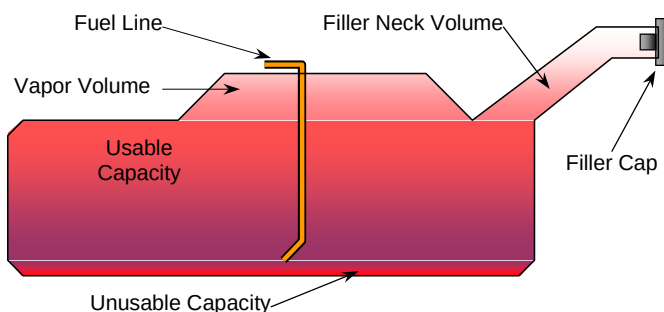
NHTSA No. MA0205  
 Test Date: 4/29/2009

#### FUEL TANK CAPACITY

|                                    | Liters       |
|------------------------------------|--------------|
| Usable Capacity of "Standard Tank" | 60.6         |
| Usable Capacity of "Optional" Tank |              |
| Usable Capacity Used for FMVSS 301 | 55.7 to 56.9 |
| Actual Amount of Solvent used      | 56.9         |

Describe the fuel pump type, its behavior, and the location of the fuel filler pipe.

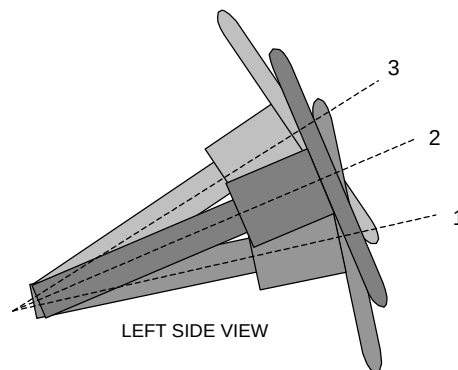
The test vehicle is equipped with an electric fuel pump. The electric fuel pump operates for 2 seconds to pressurize the fuel system following the actuation of the ignition. If no attempt has been made to start the engine within 2 seconds following ignition actuation, the fuel pump will shut off. The fuel pump operates continuously while the engine is running. If the engine stalls, the fuel pump is deactivated. Also, a fuel pump shut-off switch is provided, designed to stop fuel flow to the engine if the vehicle sustains an impact above a certain magnitude. The fuel pipe is on the left side.



VEHICLE FUEL TANK ASSEMBLY

#### STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

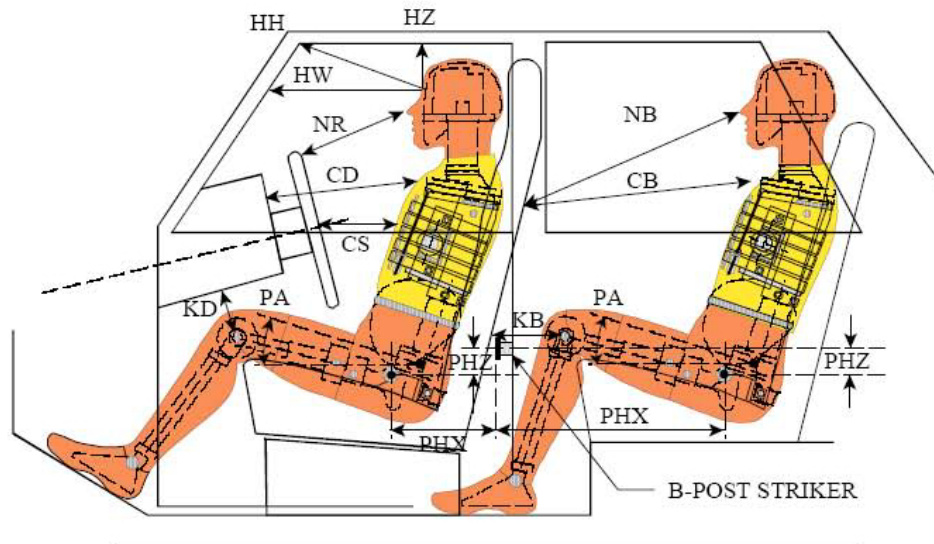
#### STEERING COLUMN POSITION

|                                   | Fore/Aft (mm) | Degrees |
|-----------------------------------|---------------|---------|
| Lowermost - Position 1            |               | 65.3    |
| Geometric Center – Position 2     |               | 67.3    |
| Uppermost – Position 3            |               | 69.3    |
| Telescoping Steering Wheel Travel |               |         |
| Test Position                     |               | 67.3    |

**DATA SHEET NO. 3**  
**DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



**LEFT SIDE VIEW**

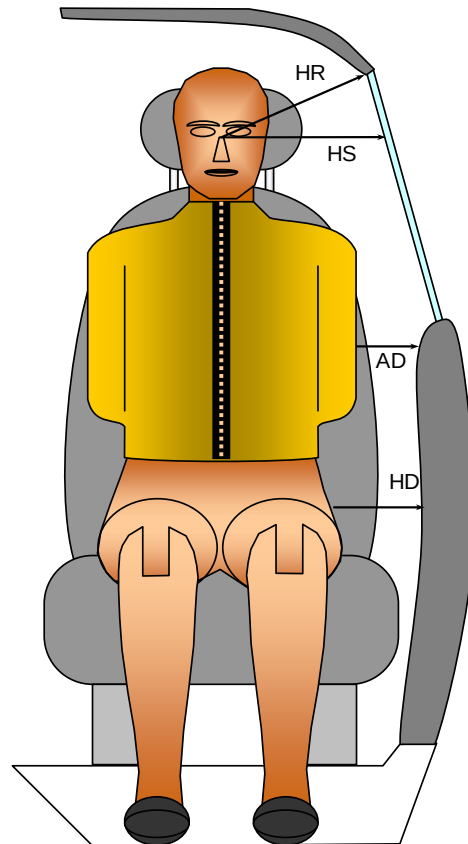
NOTE: 2-DOOR VEHICLE SHOWN.  
 REAR DUMMY PHX & PHZ  
 MEASUREMENTS FOR A 4-DOOR  
 VEHICLE WOULD USE THE C-POST  
 STRIKER AS A REFERENCE POINT

| Driver Code | Pass. Code | Measurement Description      | Driver S/N 032 |          | Passenger S/N 296 |          |
|-------------|------------|------------------------------|----------------|----------|-------------------|----------|
|             |            |                              | Length (mm)    | Angle(°) | Length (mm)       | Angle(°) |
| HH          |            | Head to Header               | 370            | 12.3     |                   |          |
| HW          |            | Head to Windshield           | 566            | 0        |                   |          |
| HZ          | HZ         | Head to Roof                 | 152            | 90       | 188               | 90       |
| NR          | NB         | Nose to Rim/Seat Back        | 427            | 15.4     | 435               | 11.6     |
| CD          | CB         | Chest to Dash/Seat Back      | 541            | 10.9     | 433               | 9.5      |
| CS          |            | Chest to Steering Wheel      | 324            | 9.6      |                   |          |
| KDL         | KBL        | Left Knee to Dash/Seat Back  | 119            | 46.0     | 175               | 19.0     |
| KDR         | KBR        | Right Knee to Dash/Seat Back | 111            | 49.4     | 160               | 20.3     |
| PA          | PA         | Pelvic Angle                 |                | 23.8     |                   | 21.1     |
| PHX         | PHX        | H-Point to Striker (X-Axis)  | 485            | 0        | 360               | 0        |
| PHZ         | PHZ        | H-Point to Striker (Z-Axis)  | 224            | 90       | 199               | 90       |
| SA          | SA         | Seat Back Angle              |                | 13.9     |                   | Fixed    |

**DATA SHEET NO. 4**  
**DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



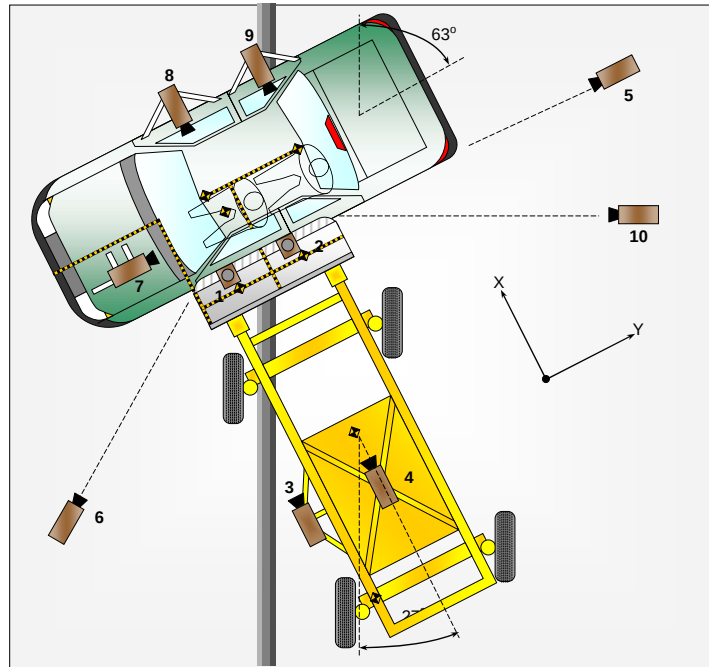
*FRONT VIEW OF DUMMY*

| Code | Measurement Description | Units | Driver S/N 032 | Passenger S/N 296 |
|------|-------------------------|-------|----------------|-------------------|
| HR   | Head to Side Header     | mm    | 202            | 301               |
| HS   | Head to Side Window     | mm    | 435            | 467               |
| AD   | Arm to Door             | mm    | 86             | 183               |
| HD   | H-Point to Door         | mm    | 135            | 157               |

**DATA SHEET NO. 5**  
**CAMERA LOCATIONS AND DATA**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



| No. | Camera View             | Location (mm) |       |       | Angle | Lens (mm) | Film Speed (fps) |
|-----|-------------------------|---------------|-------|-------|-------|-----------|------------------|
|     |                         | X             | Y     | Z     |       |           |                  |
| 1   | Overhead Overall        | 120           | 1260  | -5050 |       | 14        | 1000             |
| 2   | Overhead Close-up       | -525          | -235  | -5055 |       | 50        | 1000             |
| 3   | Left Impact Point (MDB) |               |       |       |       | 50        | 1000             |
| 4   | Side Overall (MDB)      |               |       |       |       | 16        | 1000             |
| 5   | Rear                    | 85            | 6640  | -1090 |       | 24        | 1000             |
| 6   | Left Front              | -3270         | -4840 | -1090 |       | 24        | 1000             |
| 7   | Driver Front (OB)       |               |       |       |       | 12.5      | 1000             |
| 8   | Driver Side (OB)        |               |       |       |       | 8         | 1000             |
| 9   | Passenger Side (OB)     |               |       |       |       | 8         | 1000             |
| 10  | Real Time Left Front    |               |       |       |       | 13        | 24               |
| 11  | Real Time Inrun         |               |       |       |       | 13        | 24               |

Reference: Impact Point projected to Ground  
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down  
 \* All measurements accurate to  $\pm 6$  mm

## DATA SHEET NO. 6

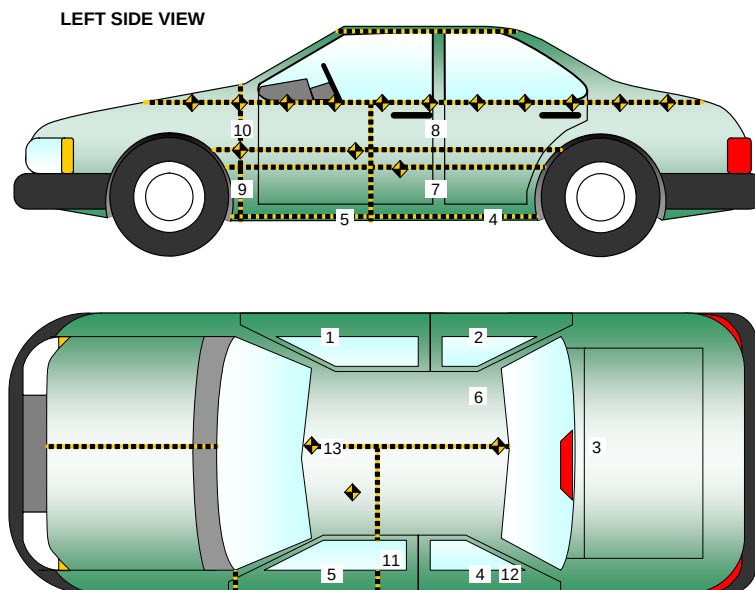
### VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe

NHTSA No. MA0205

Test Program: Side Validation Testing

Test Date: 4/29/2009



| Loc. No. | Accelerometer Location       | Measurements (mm) |      |      |
|----------|------------------------------|-------------------|------|------|
|          |                              | X                 | Y    | Z    |
| 1        | Right Sill at Front Seat     | 2430              | 731  | -151 |
| 2        | Right Sill at Rear Seat      | 1515              | 730  | -179 |
| 3        | Rear Floorpan Above Axle     | 1096              | 0    | -636 |
| 4        | Left Sill at Rear Door       | 1521              | -730 | -178 |
| 5        | Left Sill at Front Door      | 2460              | -731 | -170 |
| 6        | Rt. Rear Occ. Compartment    | 1826              | 376  | -450 |
| 7        | Left Lower B-Post            | 1865              | -720 | -578 |
| 8        | Left Middle B-Post           | 1819              | -720 | -766 |
| 9        | Left Lower A-Post            | 2997              | -702 | -289 |
| 10       | Left Middle A-Post           | 3036              | -810 | -679 |
| 11       | Front Seat Track             | 2135              | -498 | -316 |
| 12       | Rear Seat Track or Structure |                   |      |      |
| 13       | Vehicle CG                   | 2515              | 0    | -478 |

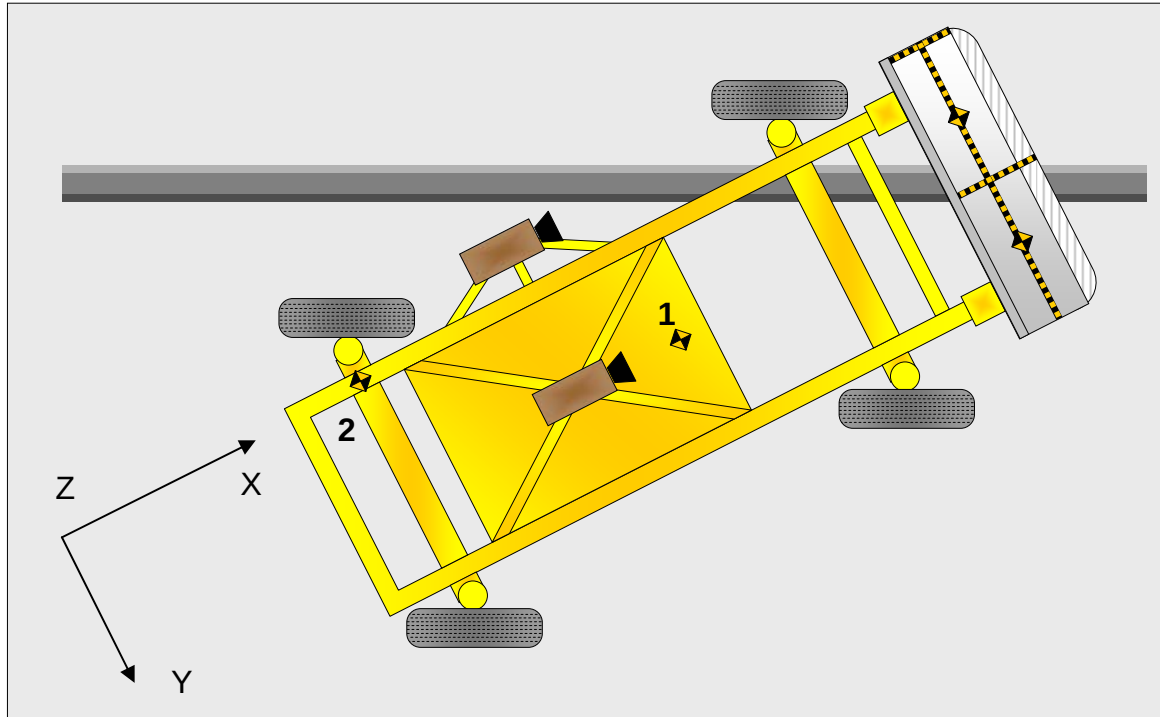
Reference: X - Test Vehicle Rear Bumper (+ forward)  
Y - Test Vehicle Centerline (+ to right)  
Z - Ground Plane (+ down)

## DATA SHEET NO. 7

### MOVING DEFORMABLE BARRIER ACCELEROMETER LOCATIONS

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



| Loc. No. | Accelerometer Location | Measurements (mm) |      |      |
|----------|------------------------|-------------------|------|------|
|          |                        | X                 | Y    | Z    |
| 1        | MDB CG                 | -1105             | 0    | -330 |
| 2        | MDB Rear               | -2580             | -650 | -625 |

Reference: X - MDB Face (+ forward)  
 Y - MDB Centerline (+ to right)  
 Z - Ground Plane (+ down)

**DATA SHEET NO. 8**  
**TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

**MAXIMUM EXTERIOR STATIC CRUSH**

| Level | Measurement Description | Units | Maximum Crush | Above Ground |
|-------|-------------------------|-------|---------------|--------------|
| 1     | Sill Top Height         | mm    | 66            | 250          |
| 2     | Occupant H-Point        | mm    | 206           | 460          |
| 3     | Mid Door                | mm    | 194           | 600          |
| 4     | Window Sill             | mm    | 46            | 925          |
| 5     | Window Top              | mm    | 23            | 1270         |
|       | Maximum Penetration     | mm    | 206           | 460          |

**INSTRUMENTATION**

|                                  |    |
|----------------------------------|----|
| Driver Dummy Channels            | 14 |
| Passenger Dummy Channels         | 21 |
| Vehicle Structure Accelerometers | 20 |
| MDB Accelerometers               | 5  |
| Total No. of Contact Switches    | 8  |
| Monitoring Channels              | 1  |
| Total                            | 69 |

**CAMERA COVERAGE**

|                            |    |
|----------------------------|----|
| High-Speed Vehicle Onboard | 3  |
| High-Speed Offboard        | 4  |
| High-Speed MDB Onboard     | 2  |
| Real-Time Stationary       | 1  |
| Real-Time Panning          | 1  |
| Total                      | 11 |

**DATA SHEET NO. 9****MOVING DEFORMABLE BARRIER SUMMARY OF RESULTS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

**MDB SPECIFICATIONS**

| Measurement Description                 | Length (mm) |
|-----------------------------------------|-------------|
| Overall Width of Framework Carriage     | 1252        |
| Overall Length Including Honeycomb Face | 4115        |
| Wheelbase of Framework Carriage         | 2592        |
| CG Location aft of Front Axle           | 1129        |

**MDB WEIGHTS**

|        | Units | Front Axle | Rear Axle | Total  |
|--------|-------|------------|-----------|--------|
| Left   | kg    | 411.8      | 281.6     |        |
| Right  | kg    | 356.8      | 311.3     |        |
| Ratio  | %     | 56.5       | 43.5      |        |
| Totals | kg    | 768.6      | 592.9     | 1361.5 |

**SPEED AND IMPACT DATA**

| Measured Parameter              | Units   | Requirement  | Value |
|---------------------------------|---------|--------------|-------|
| Trap No. 1 Velocity (Primary)   | km/h    | 61.1 to 62.7 | 62.3  |
| Trap No. 2 Velocity (Redundant) | km/h    | 61.1 to 62.7 | 62.3  |
| MDB CL to Target Vehicle CL     | degrees | 88.5 to 91.5 | 89.9  |

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE**

| Vertical Location |                  |        | From Centerline |           | Maximum Crush |
|-------------------|------------------|--------|-----------------|-----------|---------------|
| Row               | Description      | Height | Distance        | Direction |               |
| A                 | Center of Bumper | 432    | 700             | Right     | 225           |
| B                 | Top of Bumper    | 533    | 800             | Right     | 181           |
| C                 | Mid-Level        | 686    | 700             | Right     | 149           |
| D                 | Top of Stack     | 813    | 800             | Left      | 177           |

**MDB INSTRUMENTATION AND CAMERAS**

|                    |   |
|--------------------|---|
| Accelerometers     | 5 |
| Contact Switches   | 2 |
| High-Speed Cameras | 2 |

## DATA SHEET NO. 10

### POST-TEST OBSERVATIONS

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

#### TEST DUMMY INFORMATION AND CONTACT

| Description             | Front Seat Dummy (ES-2re) | Rear Seat Dummy (SID-IIs)                |
|-------------------------|---------------------------|------------------------------------------|
| Dummy Type / Serial No. | ES-2re / 032              | SID-IIs / 296                            |
| Head Contact            | Headliner, Headrest       | B-Post, Side Window, Headliner, Seatback |
| Upper Torso Contact     | Side Airbag               | Interior Panel                           |
| Lower Torso Contact     | Side Airbag               | Interior Panel                           |
| Left Knee Contact       | Door Panel                | Interior Panel                           |
| Right Knee Contact      | Left Knee                 | Left Knee                                |

#### POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

| Description           | Left Front                      | Left Rear |
|-----------------------|---------------------------------|-----------|
| Left Side Doors       | Remained closed and jammed shut |           |
| Right Side Doors      | Remained closed and operational |           |
| Hatch and Other Doors | Remained closed and operational |           |
| Seat Movement         | 0                               |           |
| Seat Back Failure     | None                            |           |

#### POST TEST STRUCTURAL OBSERVATIONS

| Critical Areas of Performance | Observations and Conclusions          |
|-------------------------------|---------------------------------------|
| Pillar Performance            | No Separation                         |
| Sill Separation               | None                                  |
| Windshield Damage             | None                                  |
| Window Damage                 | Left Front and Left Rear Window Broke |
| Other Notable Effects         | None                                  |

#### SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

| Restraint Type                | Left Front Driver |                            | Left Rear Passenger |          |
|-------------------------------|-------------------|----------------------------|---------------------|----------|
|                               | Installed         | Deployed                   | Installed           | Deployed |
| Front Airbag                  | Yes               | No                         | No                  |          |
| Knee Airbag                   | No                |                            | No                  |          |
| Side Torso Airbag             | No                |                            | No                  |          |
| Head/Torso Airbag             | Yes               | Yes (see general comments) | No                  |          |
| Side Head Curtain/Tube Airbag | No                |                            | No                  |          |
| Pretensioner                  | Yes               | Yes                        | No                  |          |
| Load Limiter                  | Yes               | No                         | No                  |          |

#### MDB LEFT EDGE IMPACT POINT DATA

| Measured Parameter | Units | Requirement | Value     |
|--------------------|-------|-------------|-----------|
| Horizontal Offset  | mm    | +/- 50      | 9 forward |
| Vertical Offset    | mm    | +/-20       | 1 down    |

## DATA SHEET NO. 11

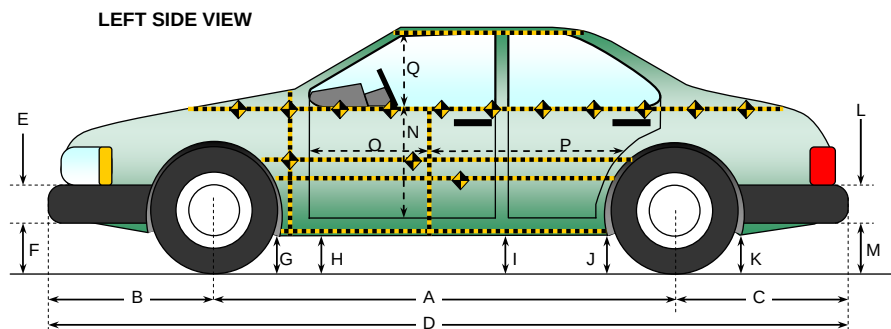
### VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe

NHTSA No. MA0205

Test Program: Side Validation Testing

Test Date: 4/29/2009



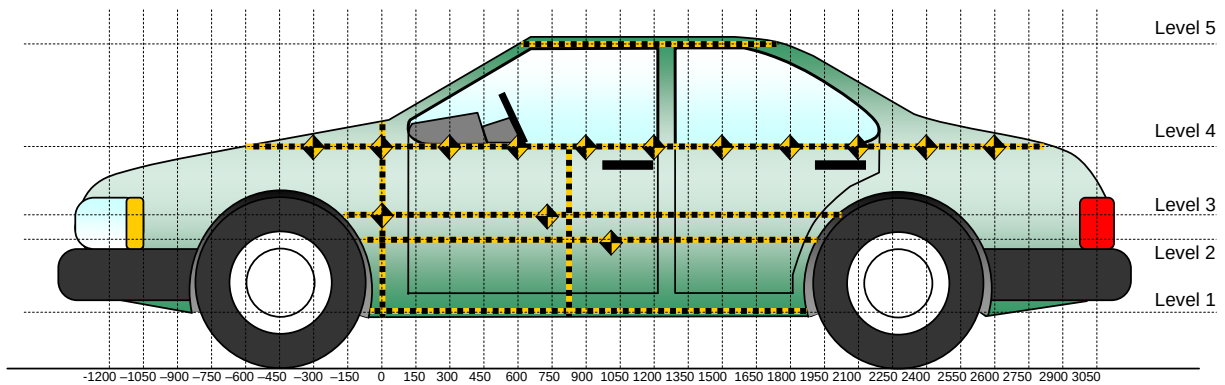
All Measurements in mm

| Code | Measurement Description                | Pre-Test | Post-Test | Difference |
|------|----------------------------------------|----------|-----------|------------|
| A    | Wheelbase                              | 2720     | 2720      | 0          |
| B    | Front Axle to FSOV                     | 902      | 920       | -18        |
| C    | Rear Axle to RSOV                      | 1146     | 1142      | 4          |
| D    | Total Length at Centerline             | 4768     | 4782      | -14        |
| E    | Front Bumper Thickness                 | 126      | 126       | 0          |
| F    | Front Bumper Bottom to Ground          | 375      | 392       | -17        |
| G    | Sill Height at Front Wheel Well        | 128      | 119       | 9          |
| H    | Sill Height at Front Door Leading Edge | 143      | 148       | -5         |
| I    | Sill Height at B Pillar                | 144      | 153       | -9         |
| J1   | Sill Height at Rear Wheel Well         | 141      | 154       | -13        |
| J2   | Pinch Weld Height at Rear Wheel Well   | 139      | 155       | -16        |
| K    | Sill Height Aft of Rear Wheel Well     | 214      | 214       | 0          |
| L    | Rear Bumper Thickness                  | 107      | 107       | 0          |
| M    | Rear Bumper Bottom to Ground           | 364      | 385       | -21        |
| N    | Sill Height to Window Bottom Sill      | 729      | 610       | 119        |
| O    | Front Door Leading Edge to Impact CL   | 520      | 510       | 10         |
| P    | Rear Door Trailing Edge to Impact CL   | 782      | 770       | 12         |
| Q    | Front Window Opening                   | 279      | 270       | 9          |
| R    | Right Side Length                      | 4161     | 4155      | 6          |
| S    | Left Side Length                       | 4161     | 4133      | 28         |
| T    | Vehicle Width at B Post                | 1849     | 1716      | 133        |

# **DATA SHEET NO. 12** **VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



All Measurements Shown in mm

## **LEFT SIDE VIEW**

Note: The measurements are taken along the vertical impact reference line.  
 Vehicle measurements forward of the vertical impact reference line are negative.

| Level | Measurement Description | Height Above Ground (mm) |
|-------|-------------------------|--------------------------|
| 1     | Sill Top                | 250                      |
| 2     | Occupant H-Point        | 460                      |
| 3     | Mid-Door                | 600                      |
| 4     | Window Sill             | 925                      |
| 5     | Window Top              | 1270                     |

**DATA SHEET NO. 12 (CONTINUED)**  
**VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

|      | Pre-Test |     |     |     |     | Post-Test |     |     |     |     | Difference |     |     |    |    |
|------|----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|------------|-----|-----|----|----|
|      | 1        | 2   | 3   | 4   | 5   | 1         | 2   | 3   | 4   | 5   | 1          | 2   | 3   | 4  | 5  |
| -900 |          |     |     | 330 |     |           |     |     | 330 |     |            |     |     | 0  |    |
| -750 |          |     |     | 310 |     |           |     |     | 314 |     |            |     |     | 4  |    |
| -600 |          |     |     | 298 |     |           |     |     | 306 |     |            |     |     | 8  |    |
| -450 |          |     |     | 287 |     |           |     |     | 303 |     |            |     |     | 16 |    |
| -300 |          |     |     | 284 |     |           |     |     | 305 |     |            |     |     | 21 |    |
| -150 |          |     |     | 282 |     |           |     |     | 308 |     |            |     |     | 26 |    |
| 0    |          | 184 | 181 | 277 |     |           | 284 | 299 | 303 |     |            | 100 | 118 | 26 |    |
| 150  | 236      | 190 | 185 | 276 |     | 292       | 378 | 336 | 299 |     | 56         | 188 | 151 | 23 |    |
| 300  | 234      | 189 | 185 | 272 |     | 298       | 395 | 353 | 306 |     | 64         | 206 | 168 | 34 |    |
| 450  | 232      | 187 | 185 | 271 |     | 298       | 380 | 373 | 308 |     | 66         | 193 | 188 | 37 |    |
| 600  | 234      | 185 | 184 | 270 |     | 299       | 380 | 378 | 305 |     | 65         | 195 | 194 | 35 |    |
| 750  | 235      | 184 | 183 | 271 |     | 299       | 374 | 366 | 310 |     | 64         | 190 | 183 | 39 |    |
| 900  | 234      | 182 | 183 | 270 | 476 | 300       | 366 | 360 | 316 | 483 | 66         | 184 | 177 | 46 | 7  |
| 1050 | 237      | 181 | 183 | 271 | 468 | 301       | 361 | 354 | 311 | 476 | 64         | 180 | 171 | 40 | 8  |
| 1200 | 237      | 181 | 183 | 271 | 466 | 299       | 354 | 352 | 314 | 477 | 62         | 173 | 169 | 43 | 11 |
| 1350 | 237      | 180 | 184 | 271 | 466 | 293       | 347 | 355 | 308 | 477 | 56         | 167 | 171 | 37 | 11 |
| 1500 | 243      | 180 | 186 | 275 | 463 | 309       | 352 | 338 | 308 | 478 | 66         | 172 | 152 | 33 | 15 |
| 1650 | 245      | 183 | 187 | 271 | 468 | 287       | 353 | 336 | 304 | 491 | 42         | 170 | 149 | 33 | 23 |
| 1800 | 250      | 184 | 178 | 265 | 469 | 266       | 314 | 338 | 298 | 480 | 16         | 130 | 160 | 33 | 11 |
| 1950 |          |     | 167 | 262 | 477 |           |     | 249 | 287 | 482 |            |     | 82  | 25 | 5  |
| 2100 |          |     |     | 267 |     |           |     |     | 286 |     |            |     |     | 19 |    |
| 2250 |          |     |     | 271 |     |           |     |     | 286 |     |            |     |     | 15 |    |
| 2400 |          |     |     | 278 |     |           |     |     | 287 |     |            |     |     | 9  |    |
| 2550 |          |     |     | 285 |     |           |     |     | 290 |     |            |     |     | 5  |    |
| 2700 |          |     |     | 297 |     |           |     |     | 298 |     |            |     |     | 1  |    |

Note: The measurements are taken along the vertical impact reference line.  
 Vehicle measurements forward of the vertical impact reference line are negative.

**MAXIMUM CRUSH DATA**

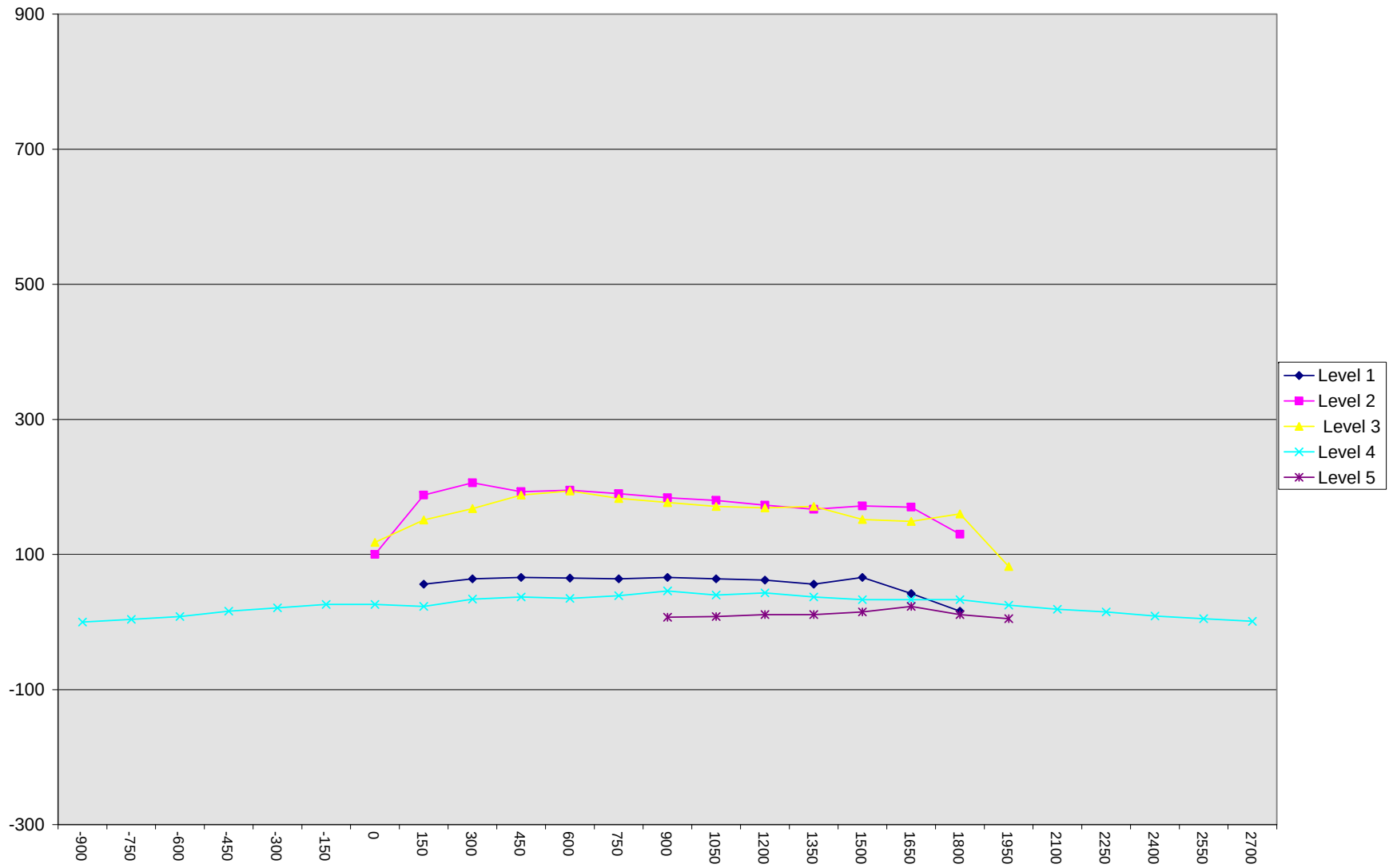
|                           | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
|---------------------------|---------|---------|---------|---------|---------|
| Maximum Crush (mm)        | 66      | 206     | 194     | 46      | 23      |
| Distance From Impact (mm) | 450     | 300     | 600     | 900     | 1650    |

## DATA SHEET NO. 12 (continued)

### VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
Test Program: Side Validation Testing

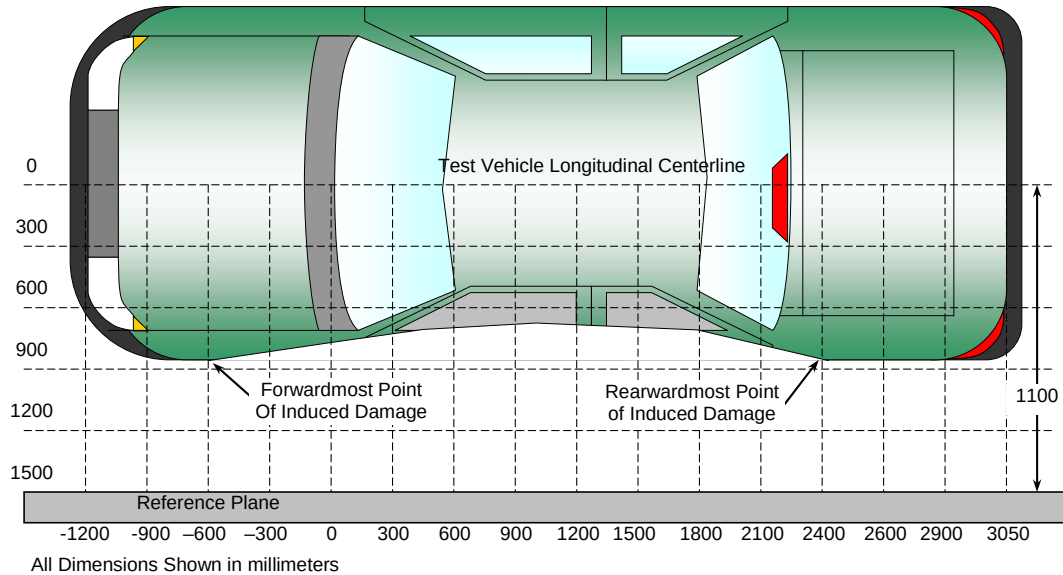
NHTSA No. MA0205  
Test Date: 4/29/2009



**DATA SHEET NO. 13**  
**VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



**TOP VIEW**

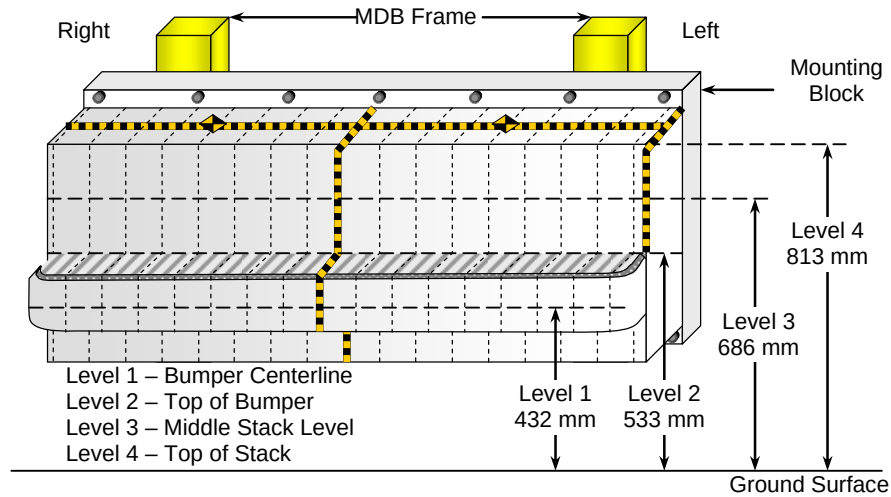
| DPD | Distance from Impact Point (mm) | Level | Pre-Test (mm) | Post-Test (mm) | Max. Static Crush (mm) |
|-----|---------------------------------|-------|---------------|----------------|------------------------|
| 1   | 2700                            | 4     | 297           | 298            | 1                      |
| 2   | 1984                            | 4     | 263           | 287            | 24                     |
| 3   | 1247                            | 2     | 181           | 383            | 202                    |
| 4   | 536                             | 2     | 186           | 403            | 217                    |
| 5   | -183                            | 4     | 283           | 313            | 30                     |
| 6   | -900                            | 4     | 330           | 330            | 0                      |

## DATA SHEET NO. 14

### EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009



### DEFORMABLE BARRIER STATIC CRUSH

| Stack Level | Distance Right of Center (mm) |     |     |     |     |     |     |     | C <sub>L</sub> | Distance Left of Center (mm) |     |     |     |     |     |     |     |
|-------------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|----------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|
|             | 800                           | 700 | 600 | 500 | 400 | 300 | 200 | 100 |                | 100                          | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| 4           | 150                           | 165 | 138 | 103 | 77  | 41  | 34  | 40  | 45             | 54                           | 63  | 70  | 95  | 123 | 163 | 160 | 177 |
| 3           | 129                           | 149 | 145 | 85  | 58  | 43  | 33  | 30  | 31             | 30                           | 31  | 40  | 62  | 103 | 133 | 130 | 134 |
| 2           | 181                           | 174 | 168 | 150 | 123 | 97  | 90  | 87  | 90             | 94                           | 95  | 97  | 105 | 115 | 107 | 114 | 124 |
| 1           | 213                           | 225 | 222 | 205 | 188 | 166 | 148 | 141 | 146            | 142                          | 143 | 145 | 157 | 177 | 170 | 169 | 162 |

## DATA SHEET NO. 15

### FMVSS 301 FUEL INTEGRITY POST-IMPACT DATA

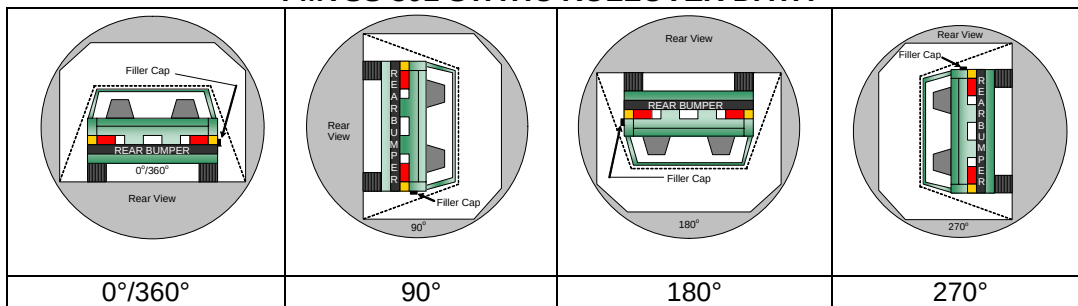
Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
 Test Program: Side Validation Testing

NHTSA No. MA0205  
 Test Date: 4/29/2009

Test Time: 11:43 am      Temperature: 21° C

- A. From impact until vehicle motion ceases: 0 oz.  
 (Maximum Allowable = 1 ounce)  
 B. For the 5 minute period after motion ceases: None  
 (Maximum allowable = 5 ounces)  
 C. For the following 25 minutes: None  
 (Maximum allowable = 1 oz./minute)  
 D. Spillage Details: None

#### FMVSS 301 STATIC ROLLOVER DATA



#### ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

| Test Phase   | Rotation Time | Hold Time | Total Time |
|--------------|---------------|-----------|------------|
| 0° to 90°    | 119           | 300       | 419        |
| 90° to 180°  | 115           | 300       | 415        |
| 180° to 270° | 105           | 300       | 405        |
| 270° to 360° | 119           | 300       | 419        |

#### FMVSS 301 ROLLOVER SPILLAGE TABLE (units in ounces)

| Test Phase   | First 5 Minutes | Sixth Minute | Seventh Minute | Eight Minute |
|--------------|-----------------|--------------|----------------|--------------|
| 0° to 90°    | 0               | 0            | 0              | 0            |
| 90° to 180°  | 0               | 0            | 0              | 0            |
| 180° to 270° | 0               | 0            | 0              | 0            |
| 270° to 360° | 0               | 0            | 0              | 0            |

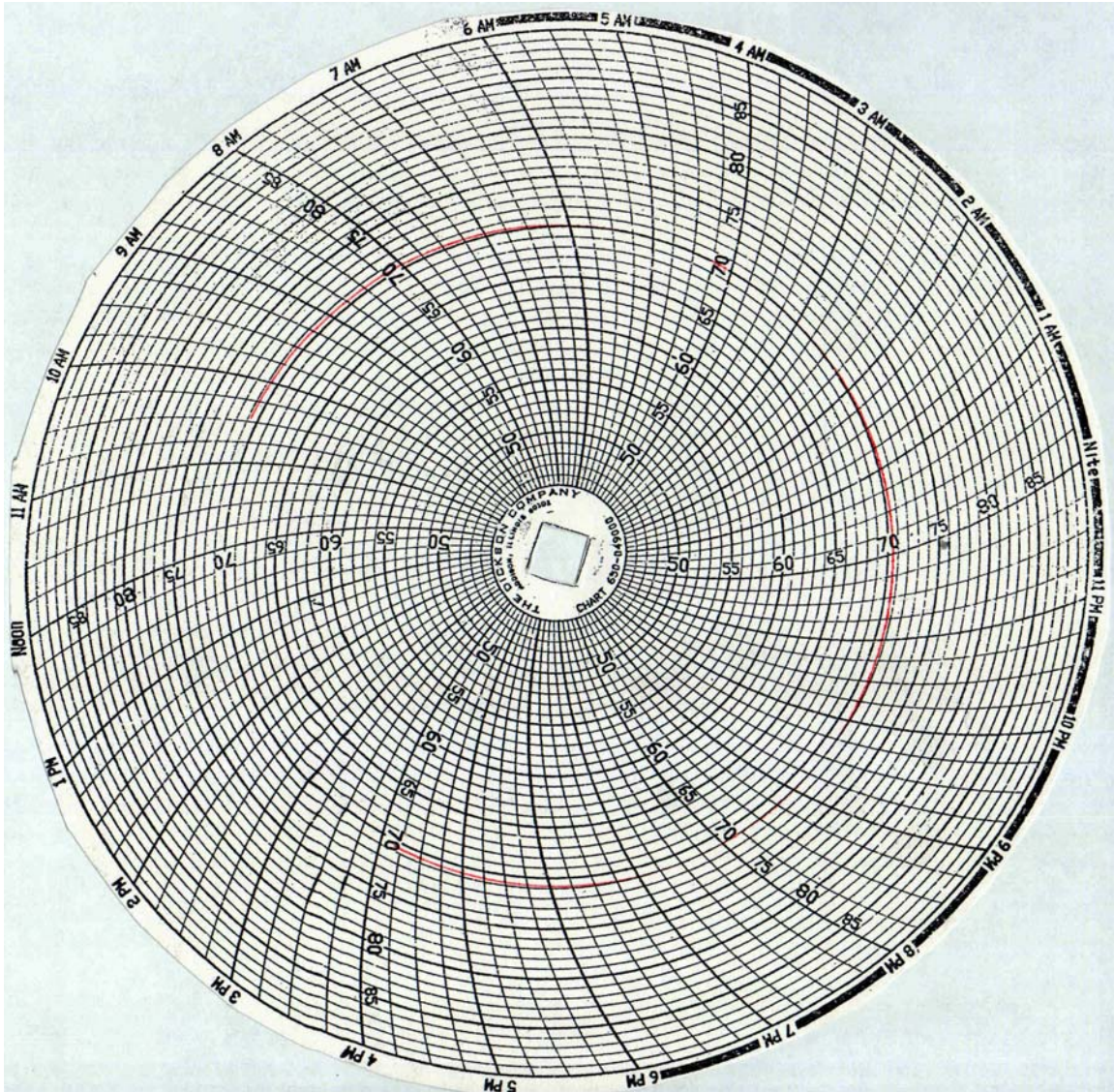
#### ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

| Test Phase   | Spillage Location |
|--------------|-------------------|
| 0° to 90°    |                   |
| 90° to 180°  |                   |
| 180° to 270° |                   |
| 270° to 360° |                   |

**DATA SHEET NO. 16**  
**DUMMY/VEHICLE TEMPERATURE STABILIZATION**

Test Vehicle: 2010 Ford Mustang 2-Dr Coupe  
Test Program: Side Validation Testing

NHTSA No. MA0205  
Test Date: 4/29/2009



**APPENDIX A**  
**PHOTOGRAPHS**

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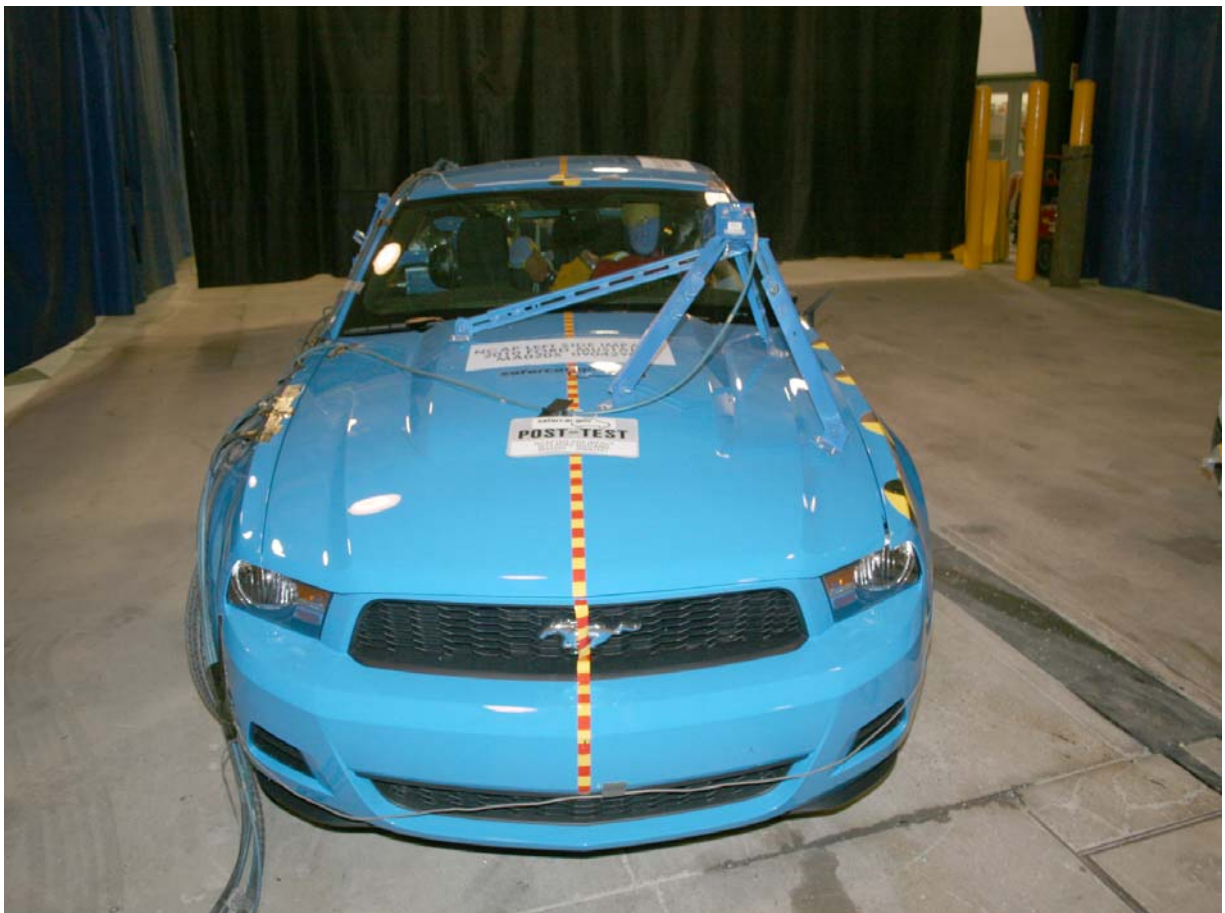
As Delivered Right Front  $\frac{3}{4}$  View of Test Vehicle



As Delivered Left Rear  $\frac{3}{4}$  View of Test Vehicle



Pre-Test Frontal View of Test Vehicle



Post-Test Frontal View of Test Vehicle



Pre-Test Left  $\frac{3}{4}$  Front View of Test Vehicle



Post-Test Left  $\frac{3}{4}$  Front View of Test Vehicle



Pre-Test Left Side View of Test Vehicle



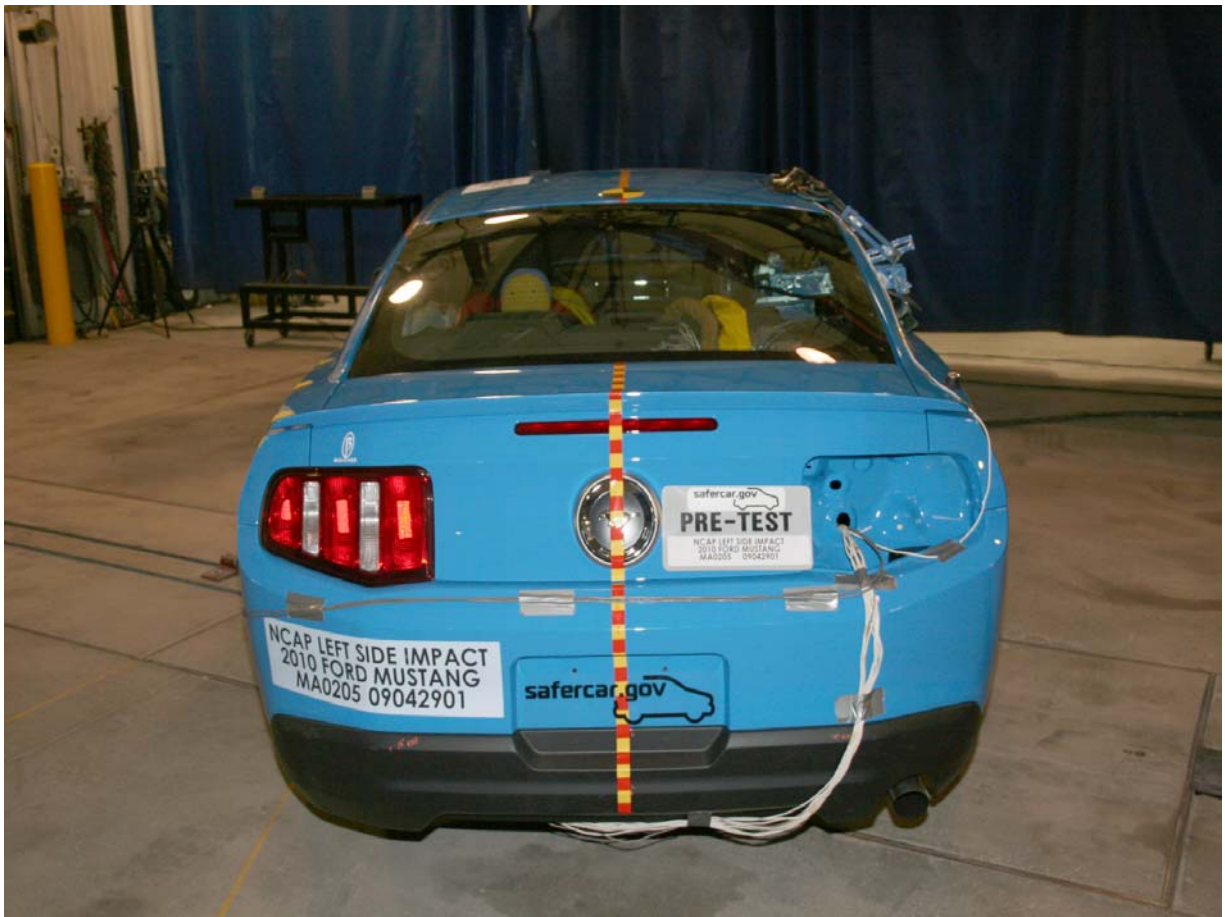
Post-Test Left Side View of Test Vehicle



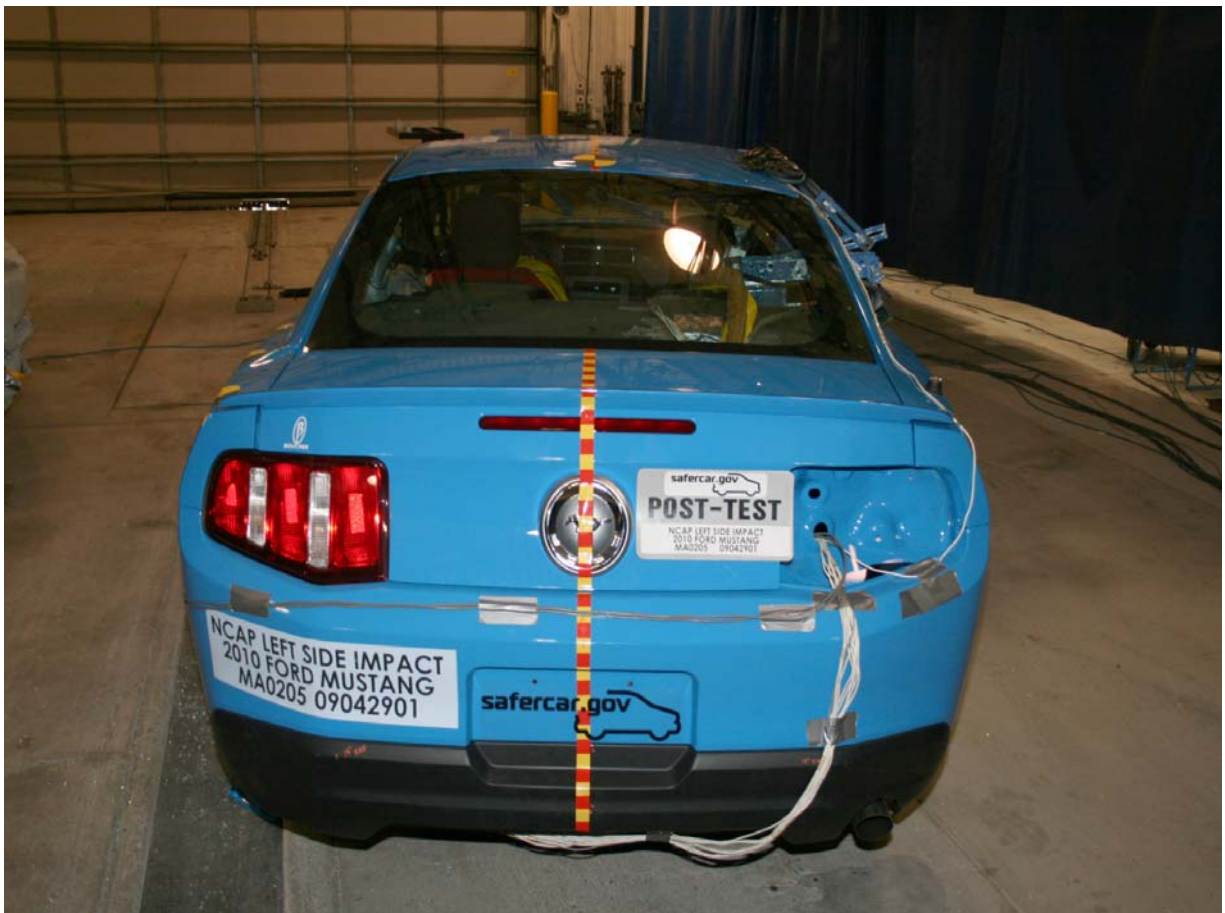
Pre-Test Left  $\frac{3}{4}$  Rear View of Test Vehicle



Post-Test Left  $\frac{3}{4}$  Rear View of Test Vehicle



Pre-Test Rear View of Test Vehicle



Post-Test Rear View of Test Vehicle



Pre-Test Right Side View of Test Vehicle



Post-Test Right Side View of Test Vehicle



Pre-Test Overhead View of the Test Vehicle with MDB Positioned Against the Side of the Test Vehicle at the Ideal Impact Point



Post-Test Overhead View of the Test Vehicle and MDB



Pre-Test Left Side View of MDB Positioned Against the Side of the Test Vehicle at the Ideal Impact Point



Pre-Test Right Side View of MDB Positioned Against the Side of the Test Vehicle at the Ideal Impact Point



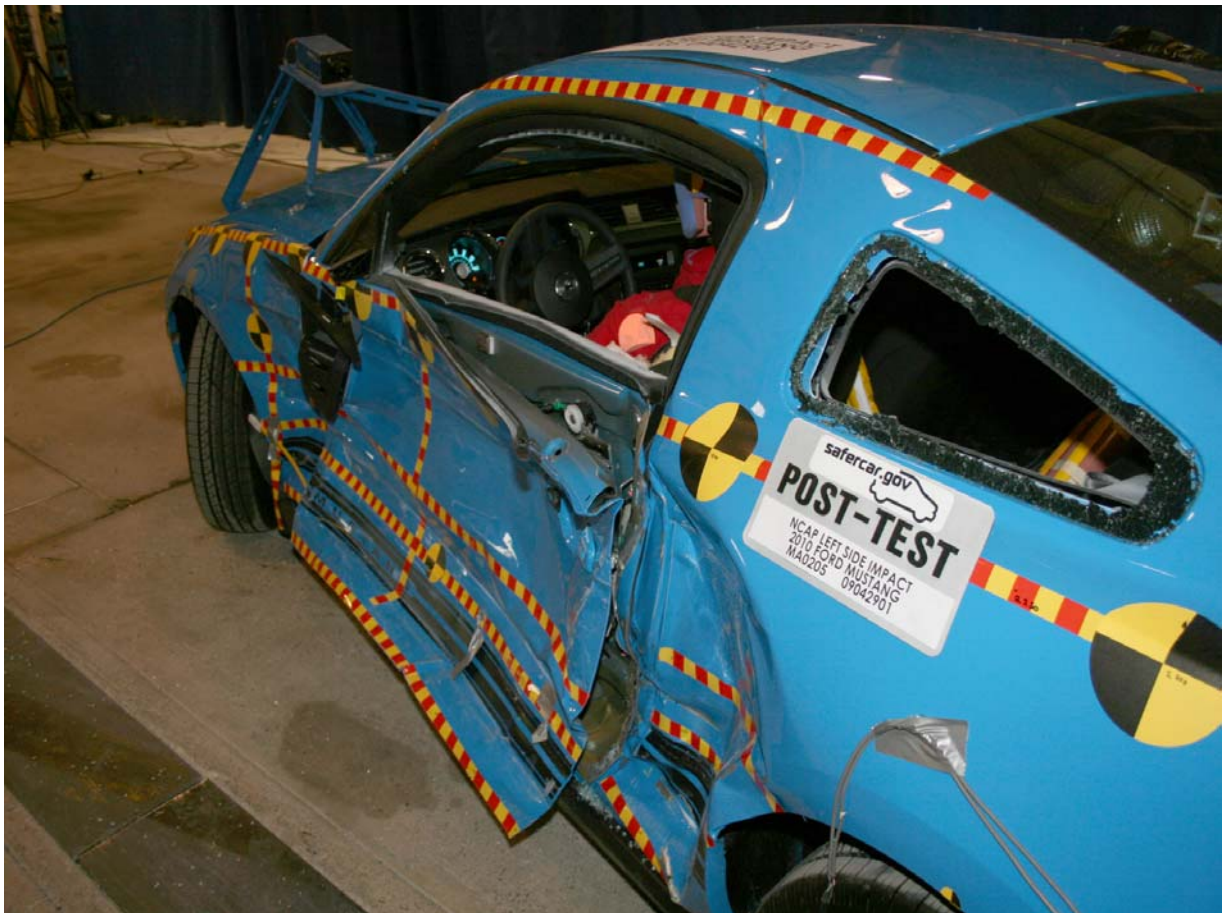
Pre-Test Close-Up View of Impact Point Target



Post-Test Close-Up View of Impact Point Target Showing Impact Point Location



Pre-Test Left Front Door Latch Close-Up



Post-Test Left Front Door Latch Close-Up

NO REAR DOOR

Pre-Test Left Rear Door Latch Close-Up

NO REAR DOOR

Post-Test Left Rear Door Latch Close-Up



Pre-Test Front Close-Up View of Driver Dummy (through front window)



Post-Test Front Close-Up View of Driver Dummy (through front window)



Pre-Test Left Side View of Driver Dummy Showing Belt, Chalking, and Contact Switches (Door Open)



Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



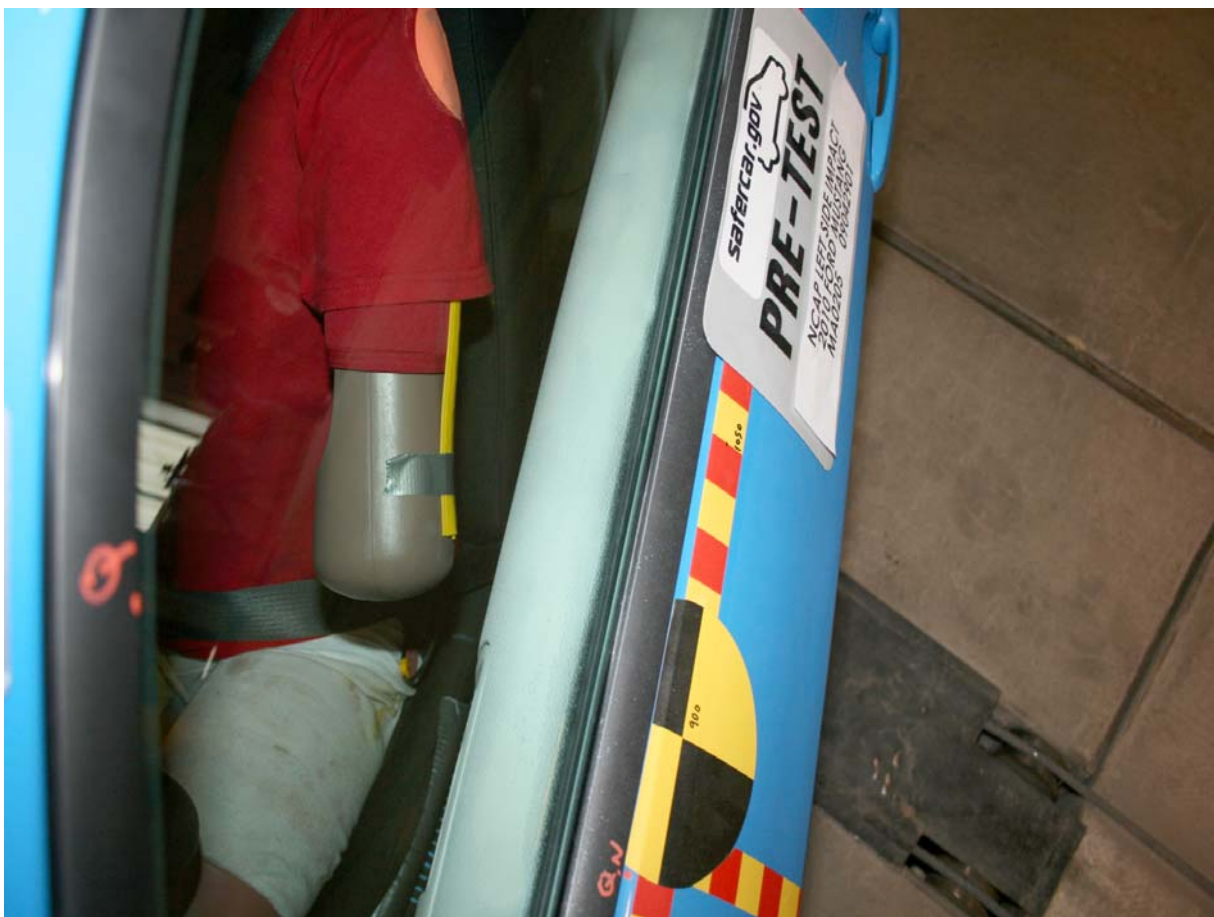
Post-Test Left Side View of Driver Dummy Shoulder and Door Top View



Pre-Test Close-Up Left Side View of Driver Seat Track Showing Seat Positioning

NO PHOTO AVAILABLE

Pre-Test Close-Up Left Side View of Driver Seat Back Showing Seat Back Positioning



Pre-Test Driver Dummy and Door Clearance View



Post-Test Driver Dummy and Door Clearance View



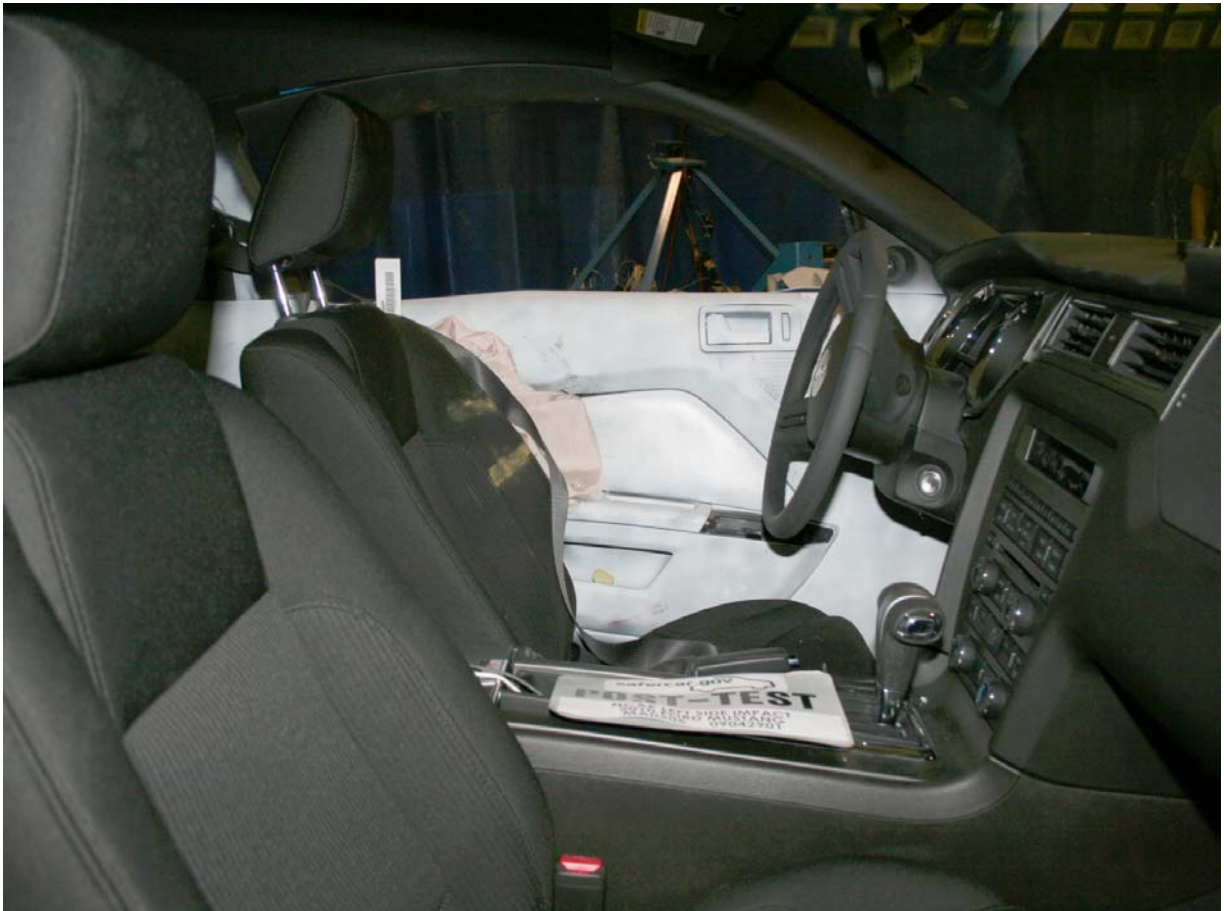
Pre-Test Right Side View of Front Seat of Occupant Compartment



Post-Test Right Side View of Front Seat of Occupant Compartment

NO PHOTO AVAILABLE

Pre-Test Driver Inner Door Panel View



Post-Test Driver Inner Door Panel View (with dummy removed)



Post-Test Driver Dummy Head Contact View



Post-Test Driver Dummy Door Contact View

NO REAR DOOR

Pre-Test Left Side View of Passenger Dummy Showing Belt, Chalking, and Contact Switches (Door Open)



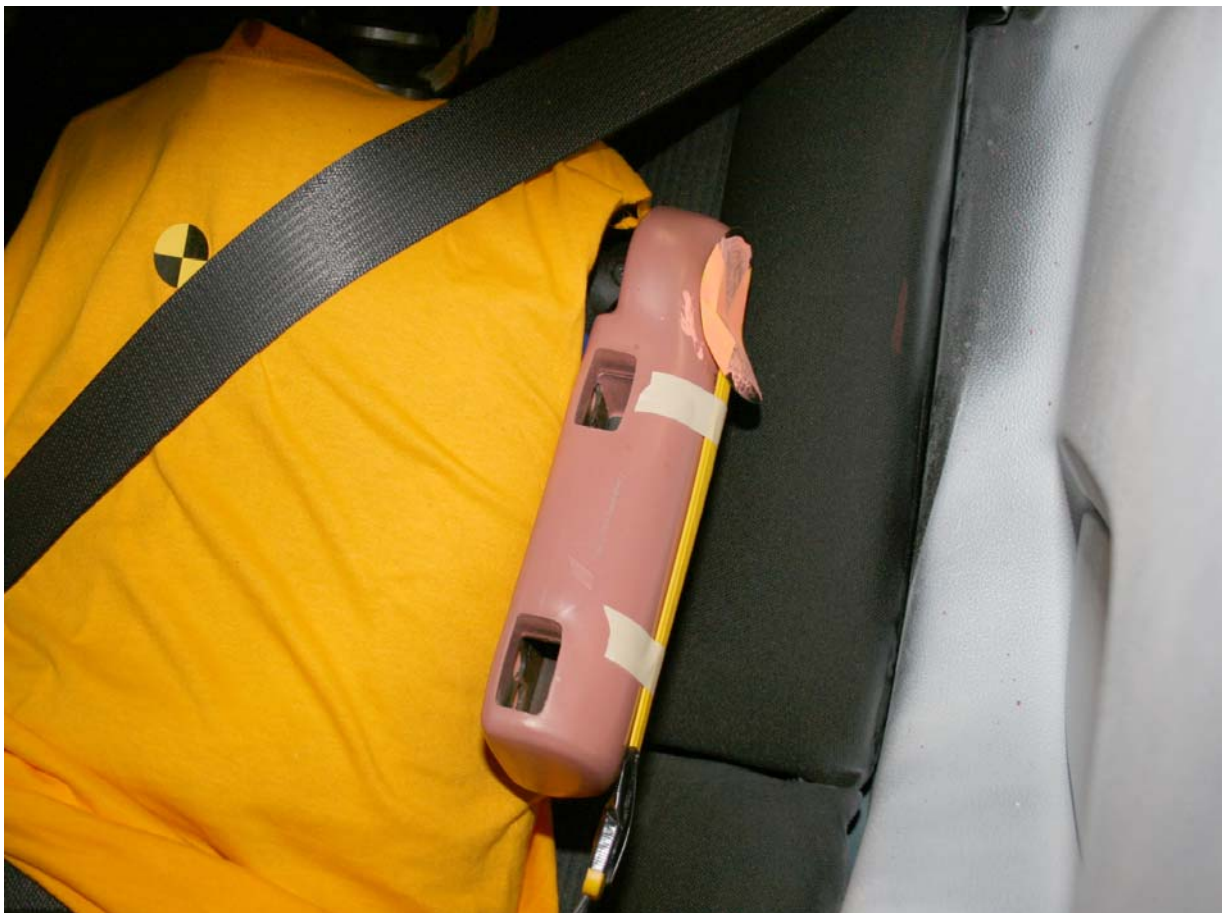
Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View



Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View



Pre-Test Close-Up Left Side View of Passenger Seat Track Showing Seat Positioning



Pre-Test Close-Up Left Side View of Passenger Seat Back Showing Seat Back Positioning



Pre-Test Passenger Dummy and Door Clearance View



Post-Test Passenger Dummy and Door Clearance View



Pre-Test Right Side View of Rear Seat of Occupant Compartment



Post-Test Right Side View of Rear Seat of Occupant Compartment

NO REAR DOOR

Pre-Test Passenger Inner Door Panel View



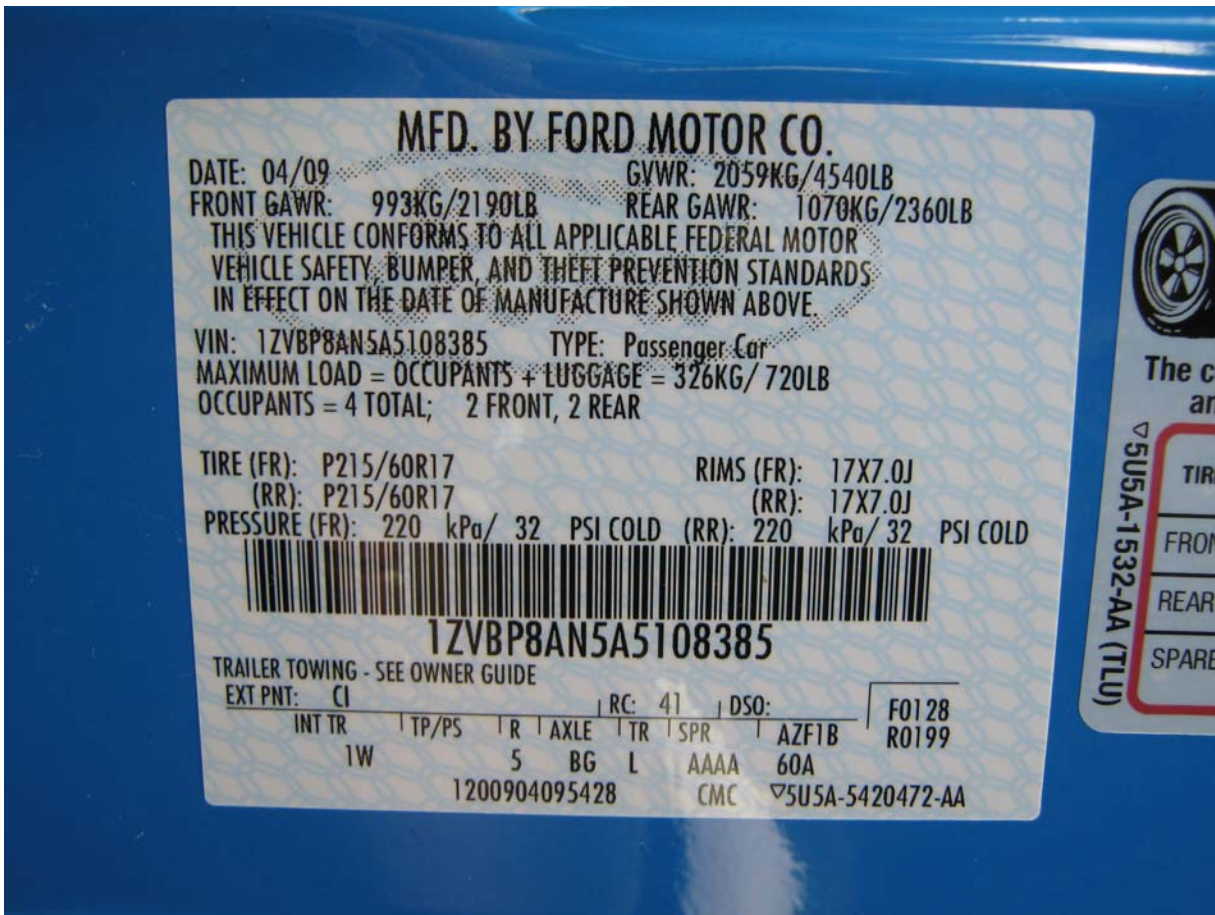
Post-Test Passenger Inner Door Panel View (with dummy removed)



Post-Test Passenger Dummy Head Contact View



Post-Test Passenger Dummy Door Contact View



Close-Up View of Vehicle's Certification Label



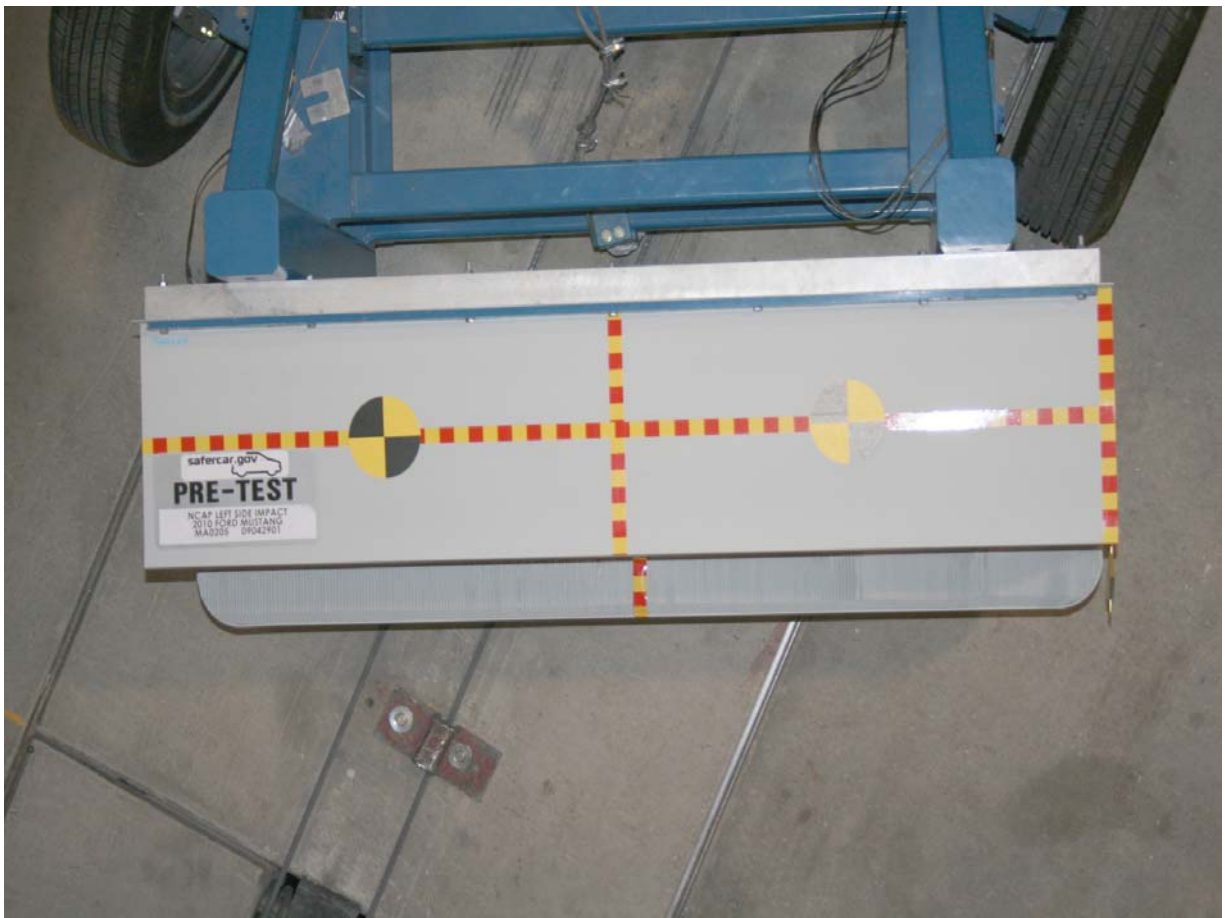
Close-Up View of Vehicle's Tire Information Placard of Label



Pre-Test Front View of MDB Impactor Face



Post-Test Front View of MDB Impactor Face



Pre-Test Top View of MDB Impactor Face



Post-Test Top View of MDB Impactor Face



Pre-Test Left Side View of MDB Impactor Face



Post-Test Left Side View of MDB Impactor Face



Pre-Test Right Side View of MDB Impactor Face



Post-Test Right Side View of MDB Impactor Face



Post-Test Primary and Redundant Speed Trap Velocity Read-Out with Placard Showing NHTSA Number



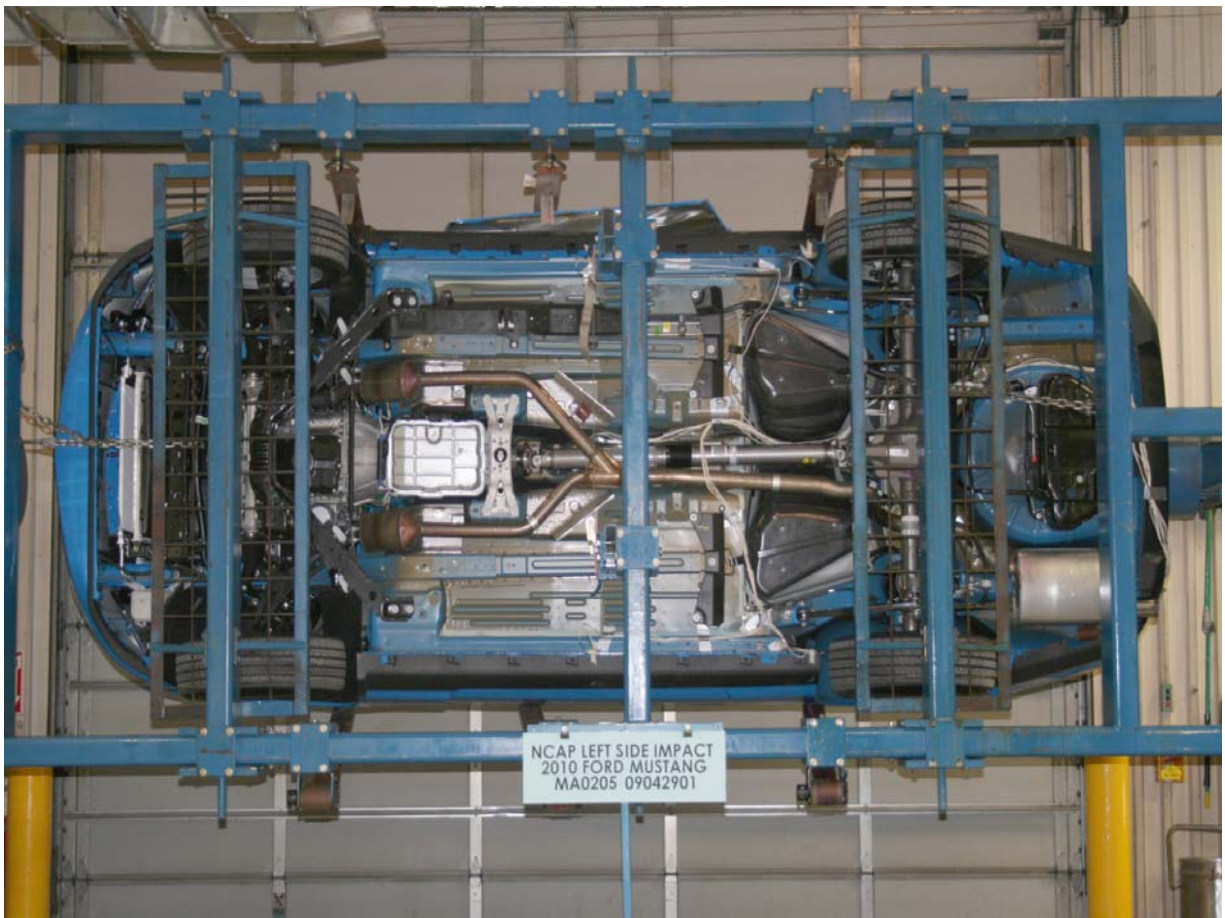
FMVSS No. 301/305 Rollover 0 Degrees



FMVSS No. 301/305 Rollover 90 Degrees



FMVSS No. 301/305 Rollover 180 Degrees



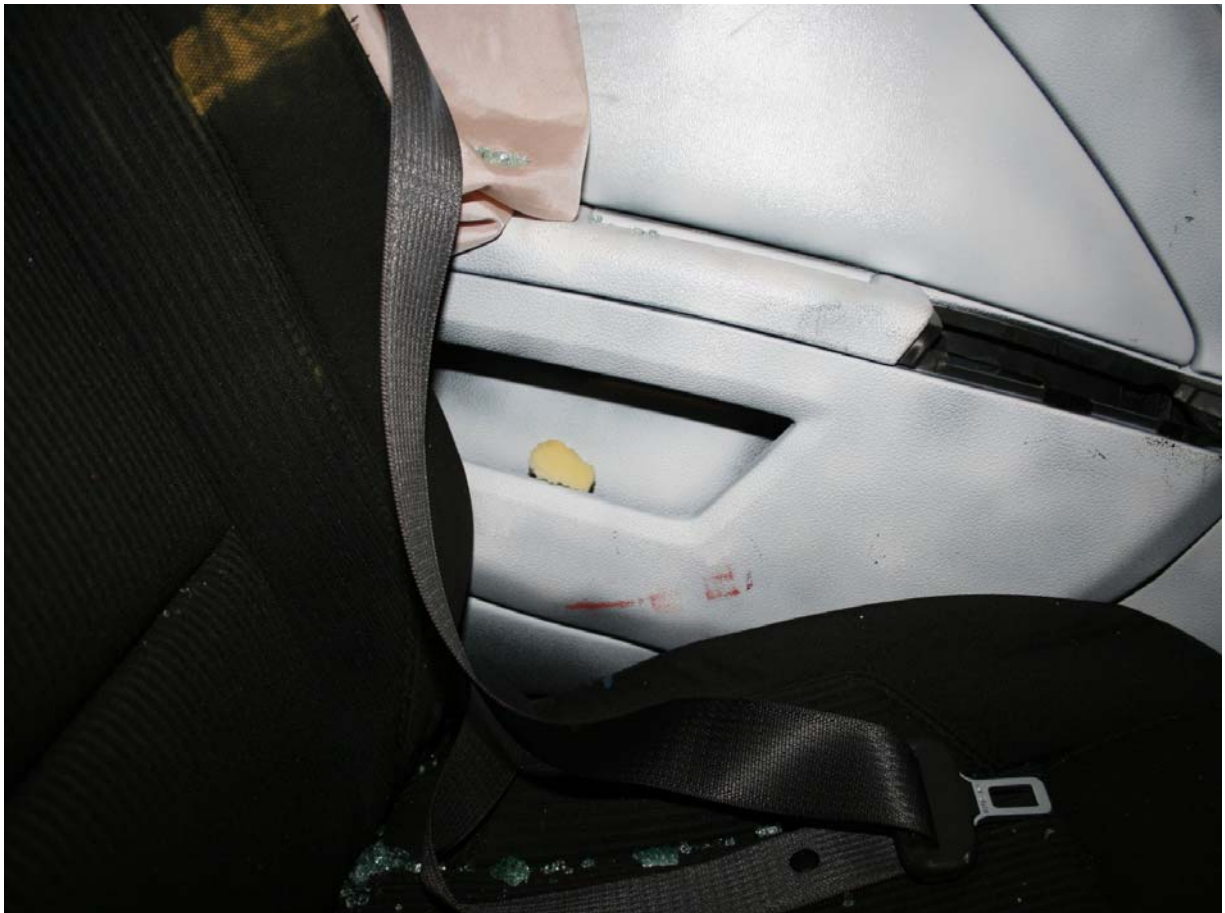
FMVSS No. 301/305 Rollover 270 Degrees



FMVSS No. 301/305 Rollover 360 Degrees



Impact Event (Impact Side)



Post-Test Driver Dummy Door Contact View 2



Post-Test Passenger Dummy Head Contact View 2



Post-Test Passenger Dummy Head Contact View 3



Post-Test Passenger Dummy Door Contact View 2



Post-Test Driver Combo Airbag View 1



Post-Test Driver Combo Airbag View 2

**APPENDIX B**  
**DUMMY RESPONSE DATA**

**TABLE OF DATA PLOTS**  
**Driver & Passenger Dummy Instrumentation Plots**  
**FILTERED DATA**

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**The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)**

**Driver & Passenger Dummy Instrumentation Data**

Driver Lower Spine T12 Acceleration (X) (not recorded)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z) (not recorded)

Passenger Upper Neck Force (X)

Passenger Upper Neck Force (Y)

Passenger Upper Neck Force (Z)

Passenger Upper Neck Moment About X

Passenger Upper Neck Moment About Y

Passenger Upper Neck Moment About Z

Passenger Shoulder Deflection (Y)

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)

Passenger Upper Abdomen Rib Deflection (Y)

Passenger Lower Abdomen Rib Deflection (Y)

Driver Head Acceleration Redundant (X)

Driver Head Acceleration Redundant (Y)

Driver Head Acceleration Redundant (Z)

Driver Shoulder Contact Switch

Driver Torso Contact Switch

Driver Pelvis Contact Switch

Passenger Head Acceleration Redundant (X)

Passenger Head Acceleration Redundant (Y)

Passenger Head Acceleration Redundant (Z)

Passenger Shoulder Contact Switch

Passenger Torso Contact Switch

Passenger Pelvis Contact Switch

### **Vehicle Instrumentation Data**

Driver Side Airbag Timing

Driver Side Curtain Airbag Timing (not installed)

Right Side Sill at Front Seat Acceleration (X)

Right Side Sill at Front Seat Acceleration (Y)

Right Side Sill at Front Seat Acceleration (Z)

Right Side Sill at Rear Seat Acceleration (X)

Right Side Sill at Rear Seat Acceleration (Y)

Right Side Sill at Rear Seat Acceleration (Z)

Rear Floorpan Above Axle Acceleration (X)

Rear Floorpan Above Axle Acceleration (Y)

Rear Floorpan Above Axle Acceleration (Z)

Left Side Sill at Front Seat Acceleration (Y)

Left Side Sill at Rear Seat Acceleration (Y)

Right Rear Occupant Compartment Acceleration (Y)

Lower A-Post Acceleration (Y)

Upper A-Post Acceleration (Y)

Lower B-Post Acceleration (Y)

Upper B-Post Acceleration (Y)

Front Seat Track Acceleration (Y)

Rear Seat Track Acceleration (Y) (not installed)

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

### **MDB Instrumentation Data**

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

MDB Center of Gravity Acceleration (Z)

MDB Center of Gravity Resultant Acceleration (not reported)

MDB Rear Acceleration (X)

MDB Rear Acceleration (Y)

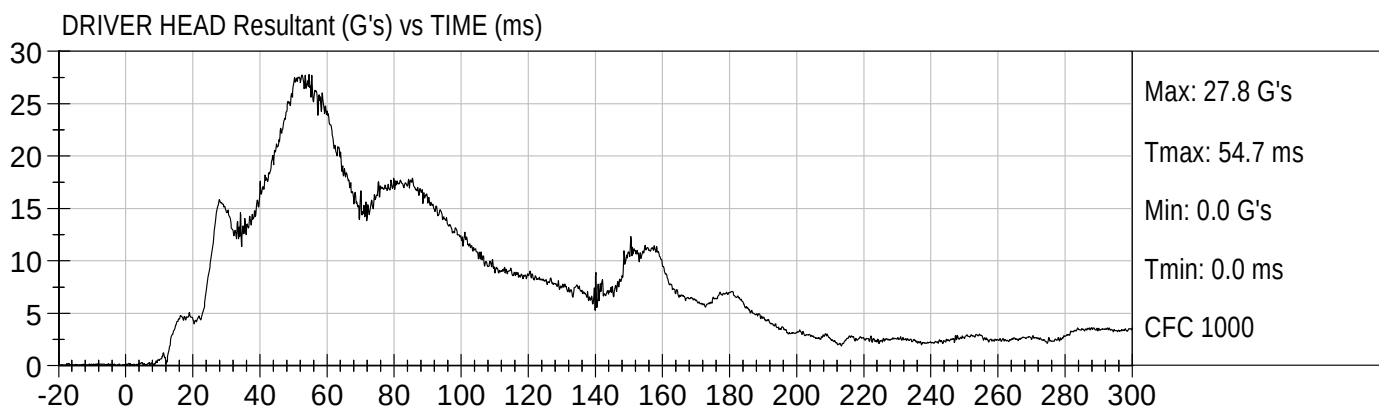
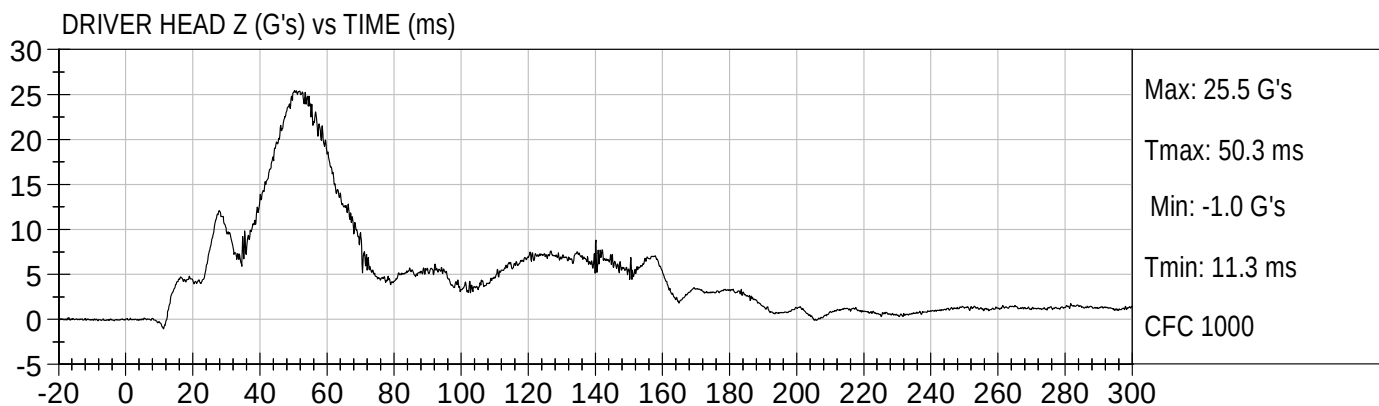
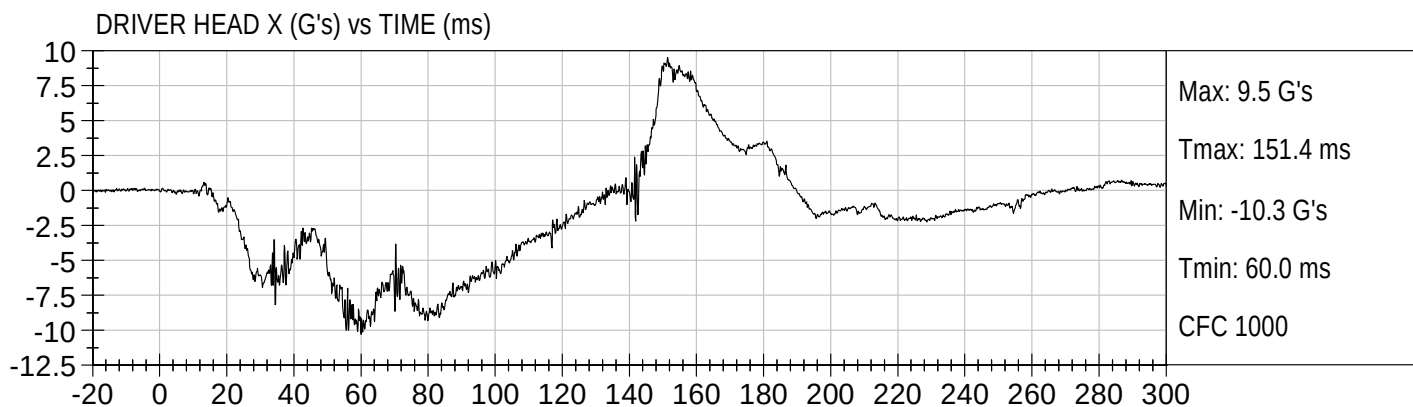
Left MDB Contact Switch

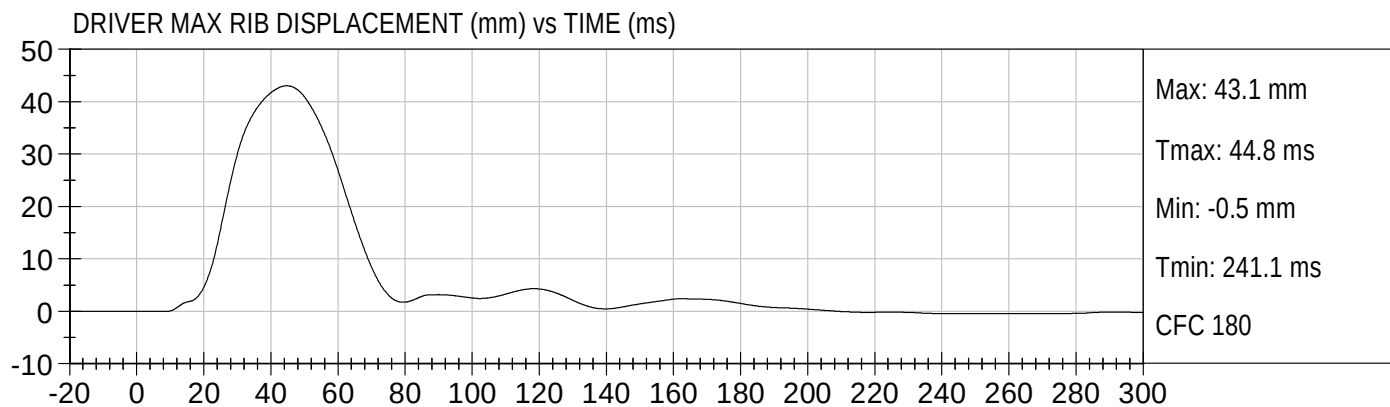
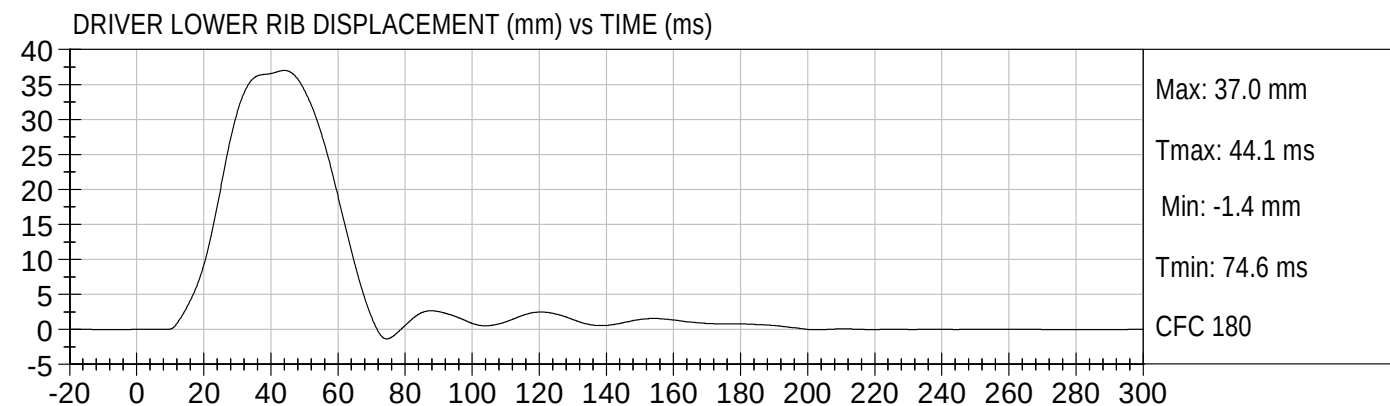
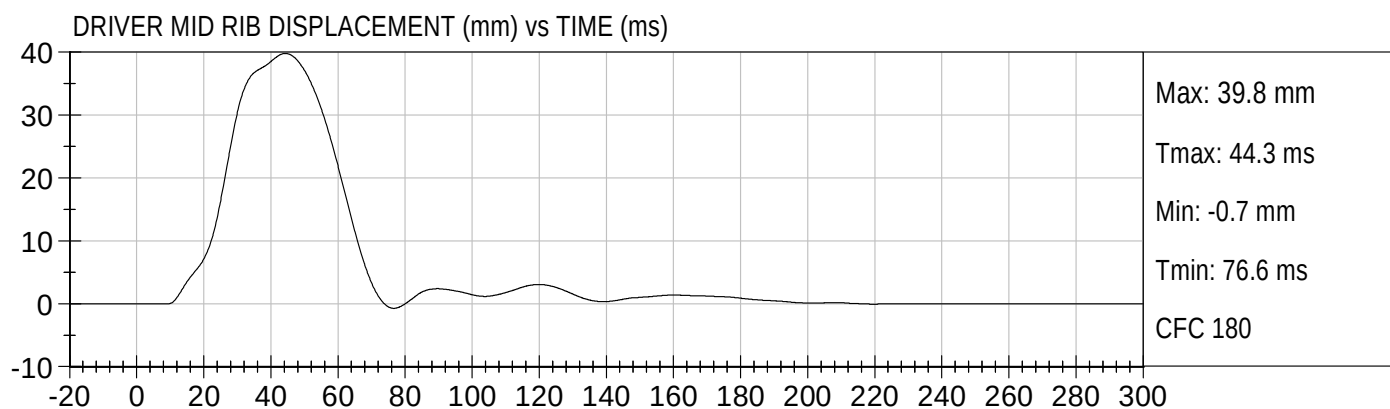
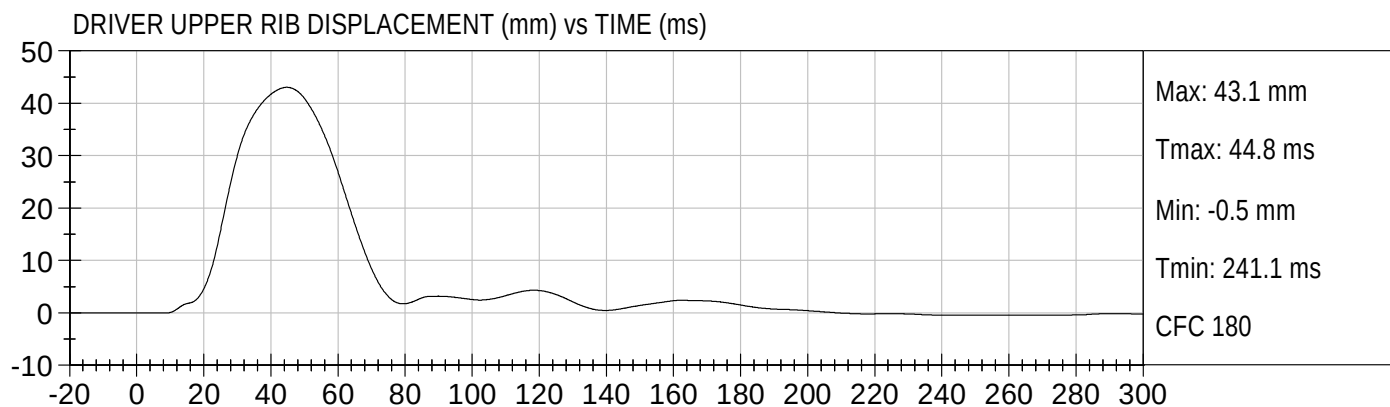
Right MDB Contact Switch



55/28 km/h 90° NCAP Side Impact  
2010 Ford Mustang Coupe - MA0205

Test Date: 04/29/2009  
Speed: 38.7 mph (62.3 km/h)

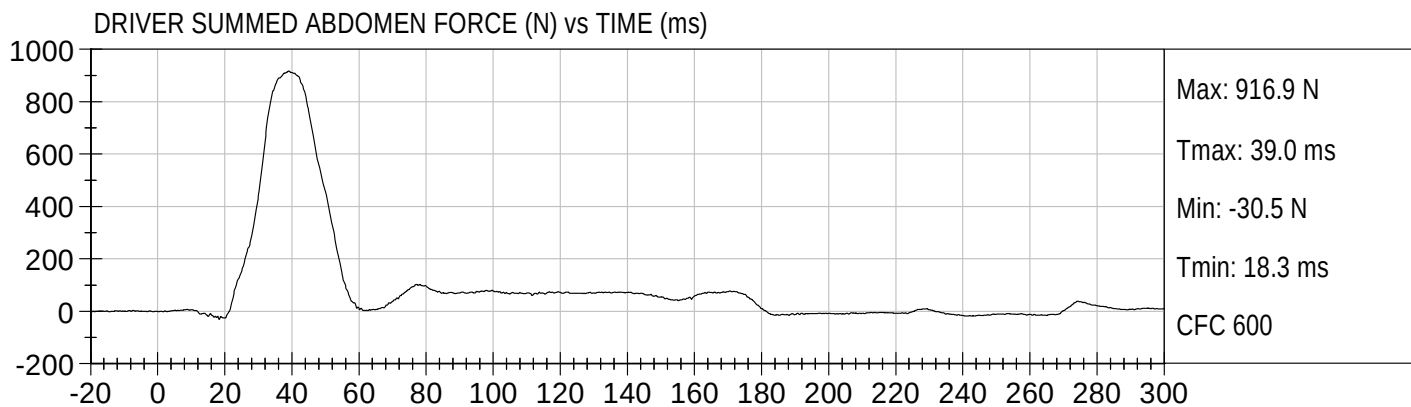
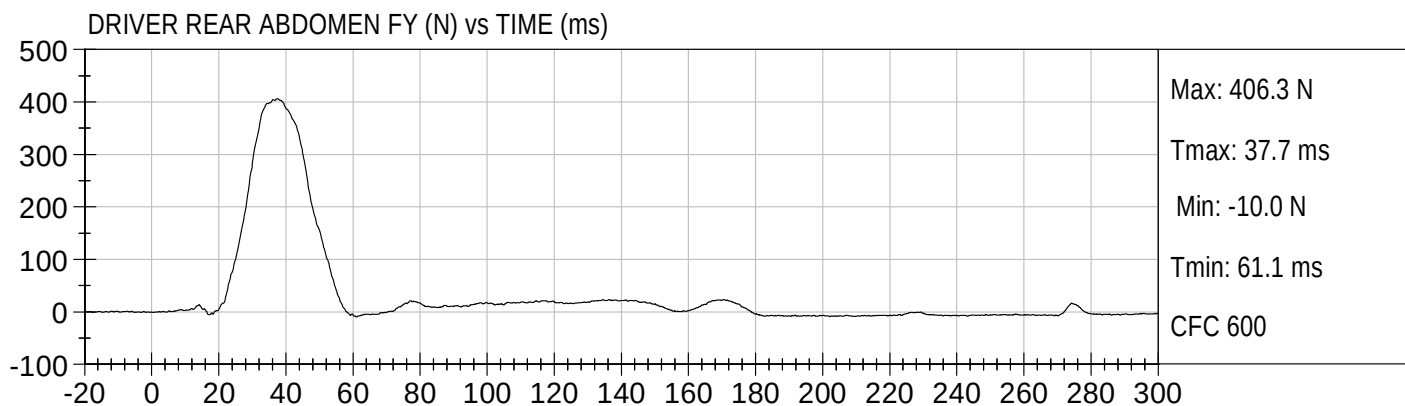
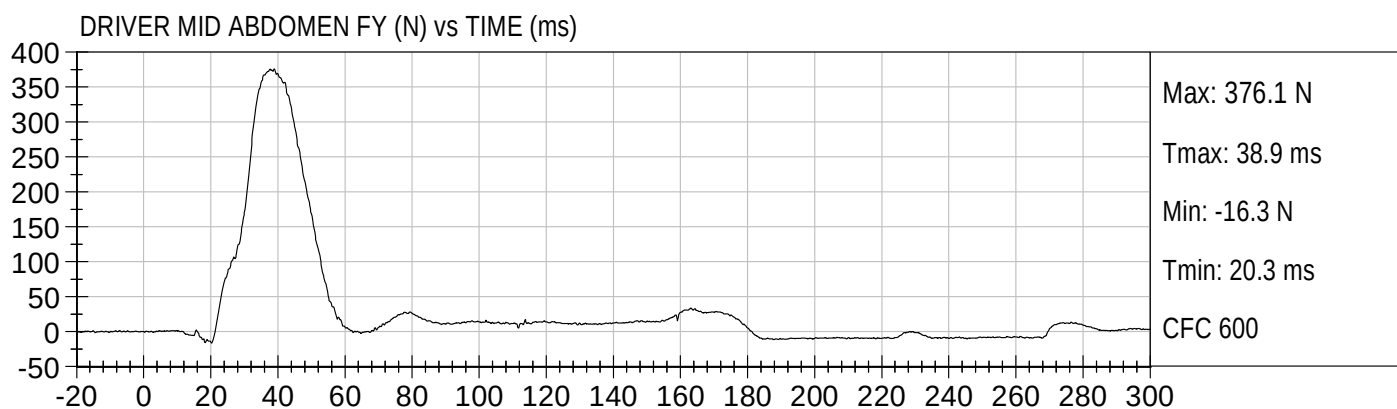
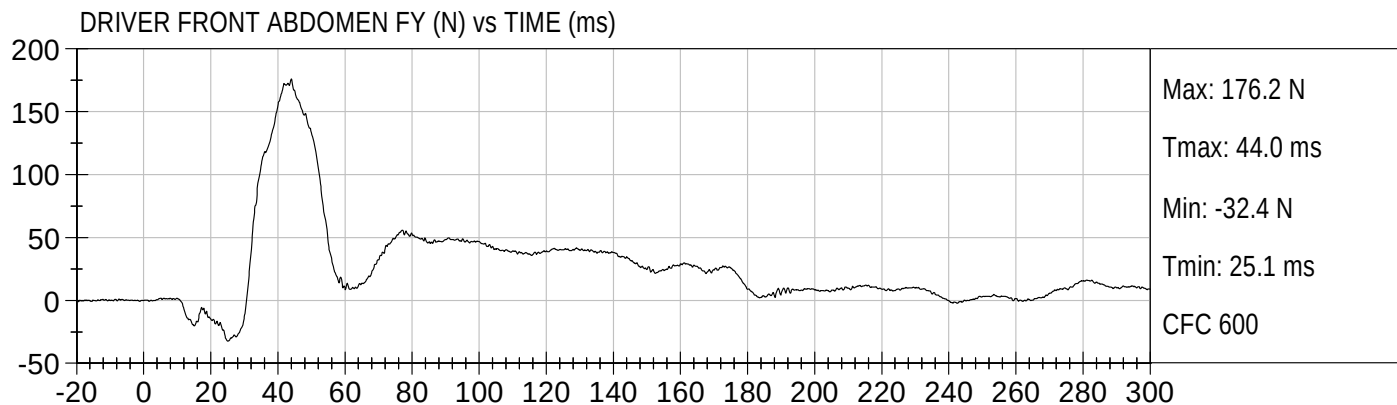






55/28 km/h 90° NCAP Side Impact  
2010 Ford Mustang Coupe - MA0205

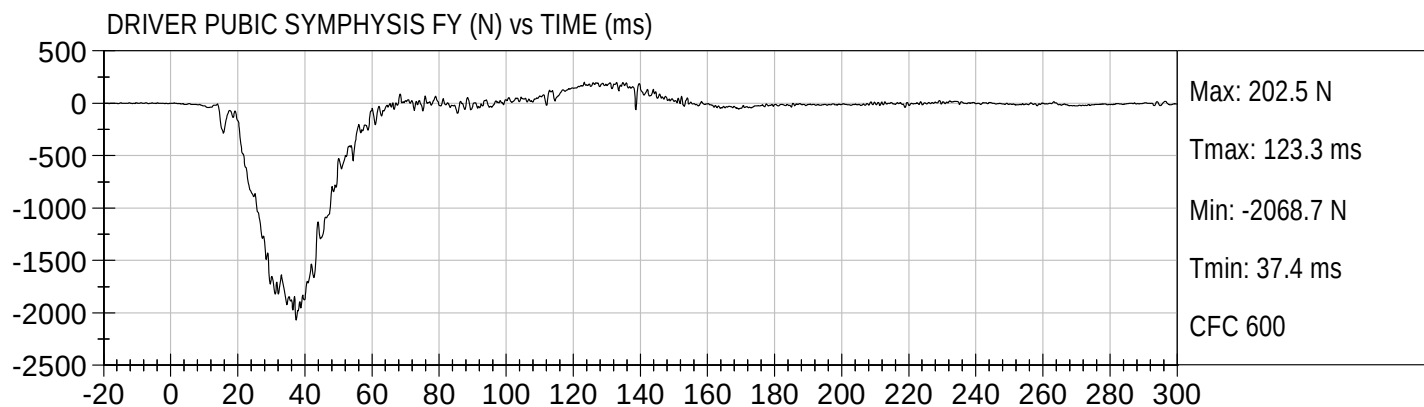
Test Date: 04/29/2009  
Speed: 38.7 mph (62.3 km/h)

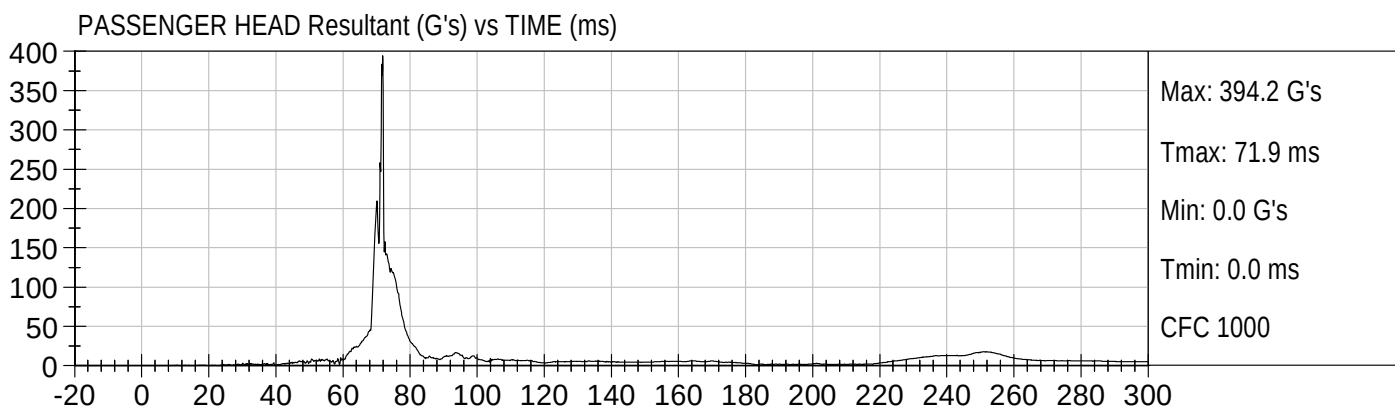
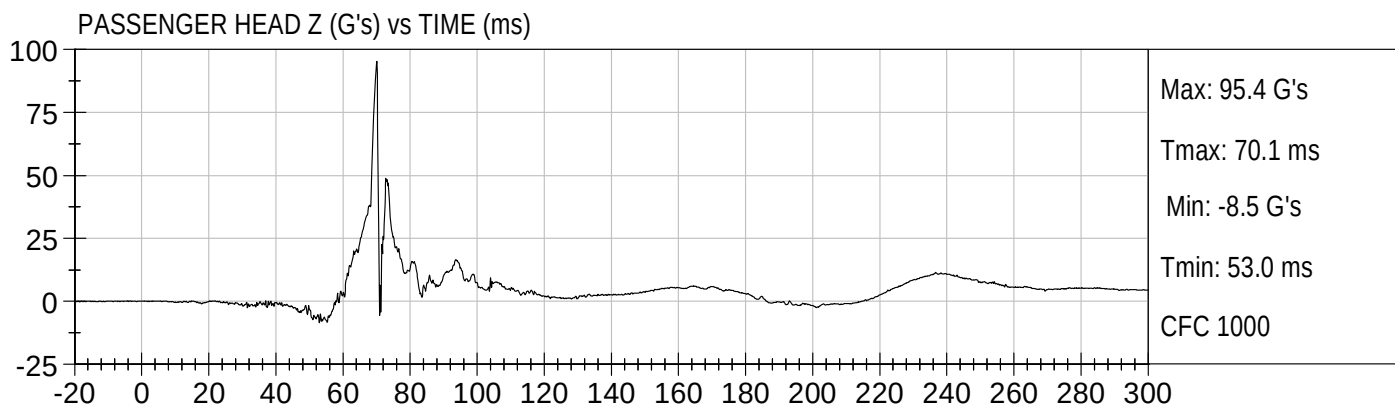
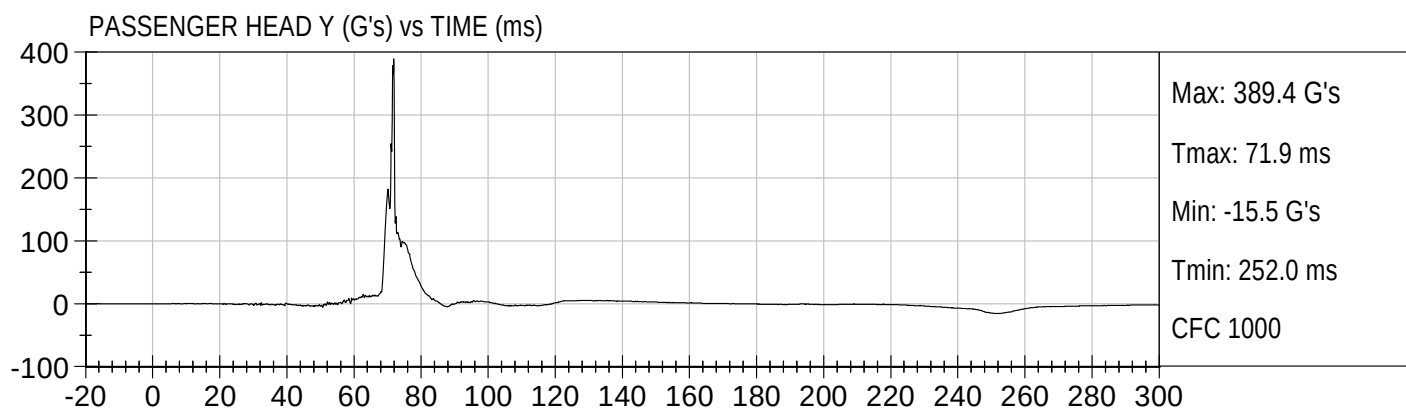
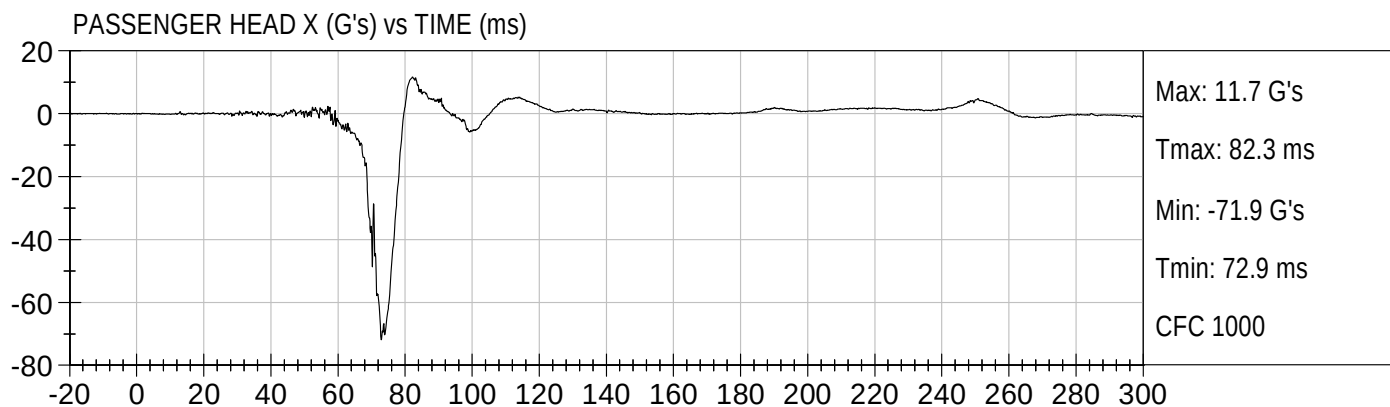




55/28 km/h 90° NCAP Side Impact  
2010 Ford Mustang Coupe - MA0205

Test Date: 04/29/2009  
Speed: 38.7 mph (62.3 km/h)

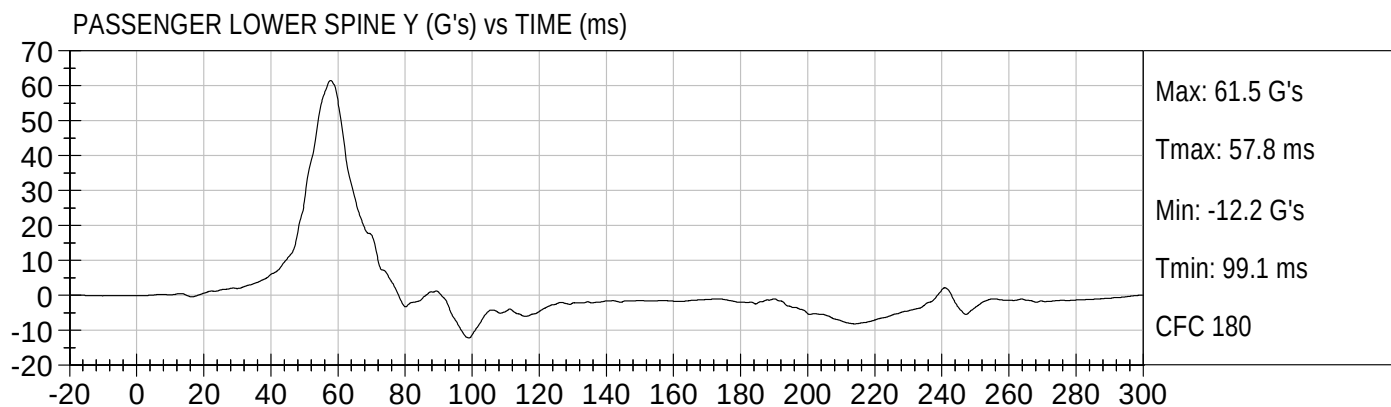


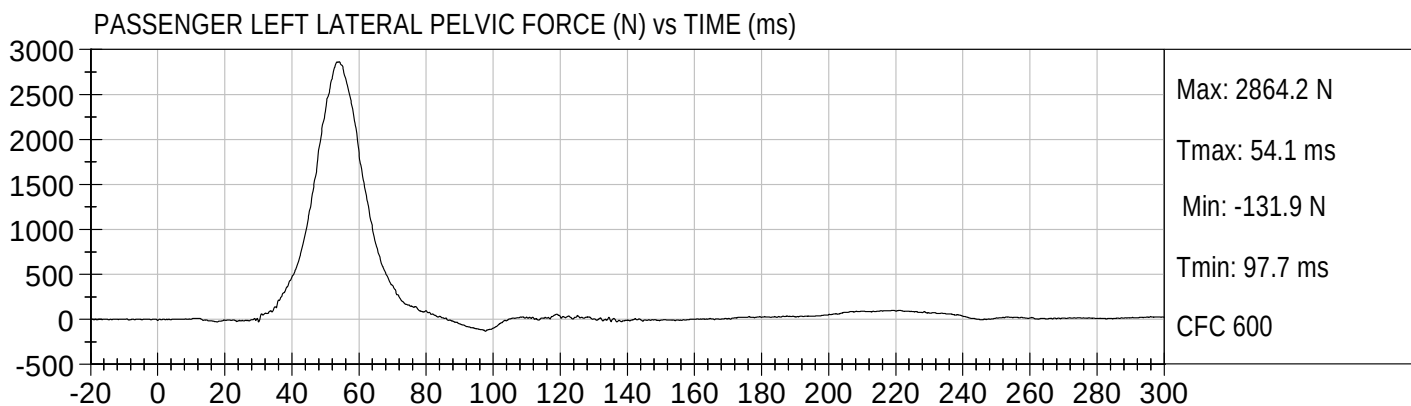
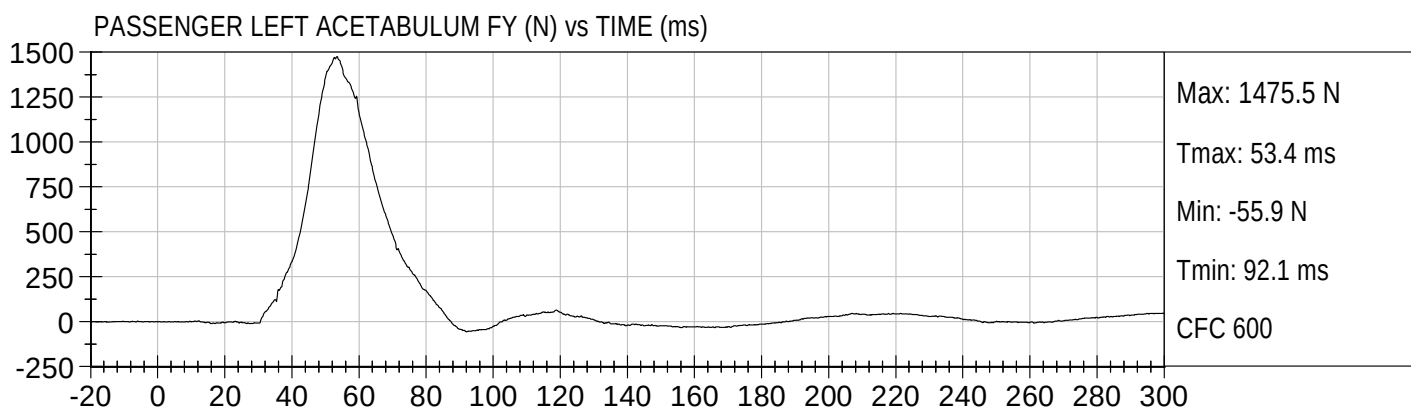
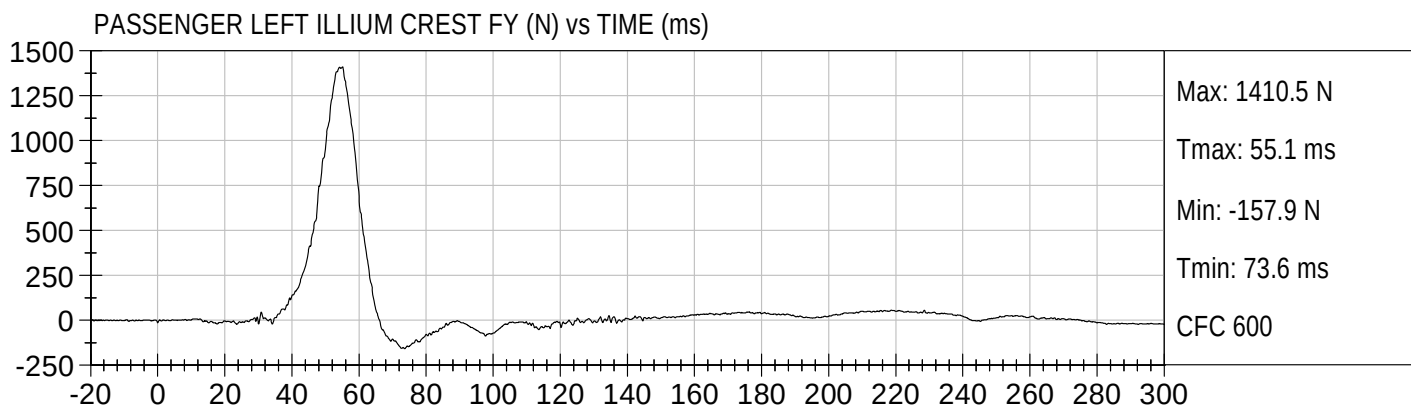




55/28 km/h 90° NCAP Side Impact  
2010 Ford Mustang Coupe - MA0205

Test Date: 04/29/2009  
Speed: 38.7 mph (62.3 km/h)





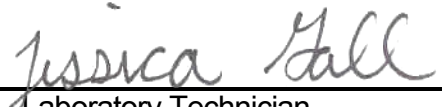
**APPENDIX C**  
**DUMMY CALIBRATION DATA**

**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test ID:** D09881

| Tested Parameter             | Units | Specification      | Result | Pass/Fail |
|------------------------------|-------|--------------------|--------|-----------|
| Laboratory Temperature       | deg C | 18.9 to 25.6       | 21.3   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70           | 29     | Pass      |
| Peak Resultant Acceleration  | G's   | 125 to 155         | 147    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15             | -13.1  | Pass      |
| Unimodal                     | N/A   | Yes                | Yes    | Pass      |
| Oscillations                 | N/A   | within 15% of peak | Yes    | Pass      |
| Overall Test Results         |       |                    |        | Pass      |

  
Laboratory Technician

4/23/09  
Test Date

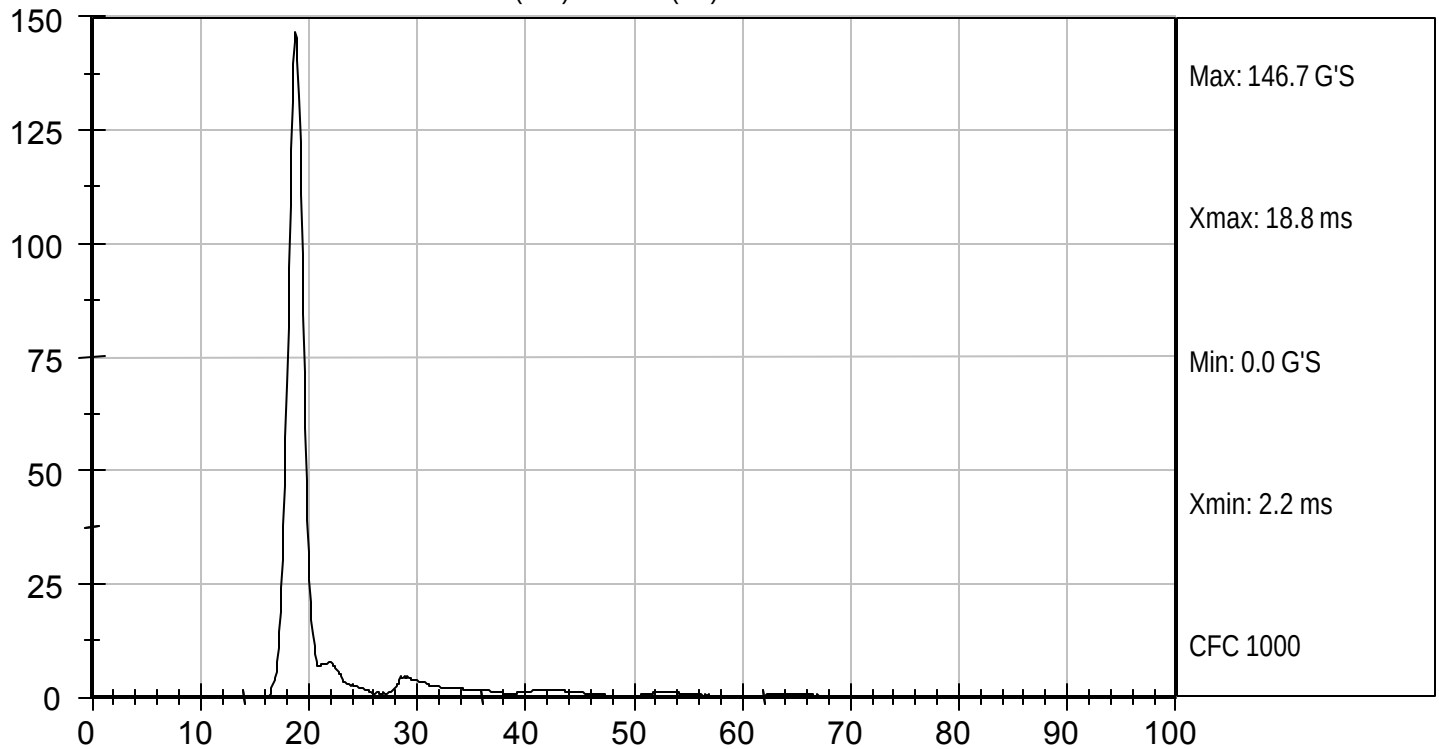
  
Approved By



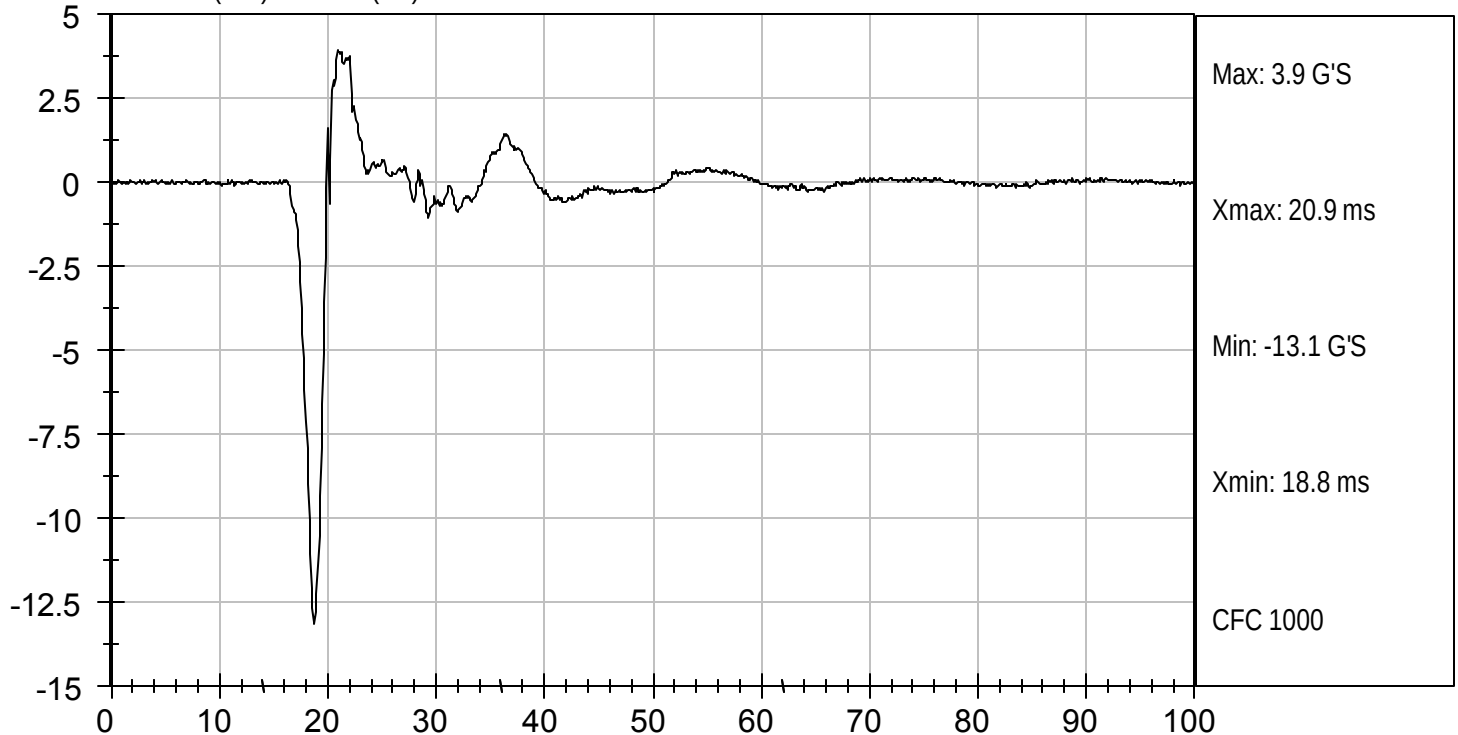
Test Desc: Head Drop  
Component ID: D09881

Test Date: 4/23/09  
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (ms)



HEAD X (G'S) vs TIME (ms)

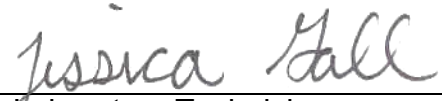


**MGA RESEARCH CORPORATION**  
**NECK PENDULUM TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09882

| Tested Parameter                     |         | Units | Specification   | Result | Pass/Fail |
|--------------------------------------|---------|-------|-----------------|--------|-----------|
| Laboratory Temperature               |         | deg C | 18.0 to 22.0    | 21.5   | Pass      |
| Laboratory Relative Humidity         |         | %     | 10 to 70        | 31     | Pass      |
| Pendulum Speed                       |         | m/s   | 3.3 to 3.5      | 3.4    | Pass      |
| Pendulum Deceleration                | 1 msec  | G's   | 0.00 to -0.05   | -0.03  | Pass      |
|                                      | 3 msec  | G's   | -0.25 to -0.375 | -0.33  | Pass      |
|                                      | 14 msec | G's   | -3.20 to -3.70  | -3.28  | Pass      |
| Maximum Flexion Angle                |         | deg   | 49.0 to 59.0    | 51.0   | Pass      |
| Time of Maximum Flexion Angle        |         | msec  | 54.0 to 66.0    | 61.1   | Pass      |
| Head Rotation Decay Time to 0 degree |         | msec  | 53 to 88        | 53     | Pass      |
| Overall Test Results                 |         |       |                 |        | Pass      |

  
 Laboratory Technician

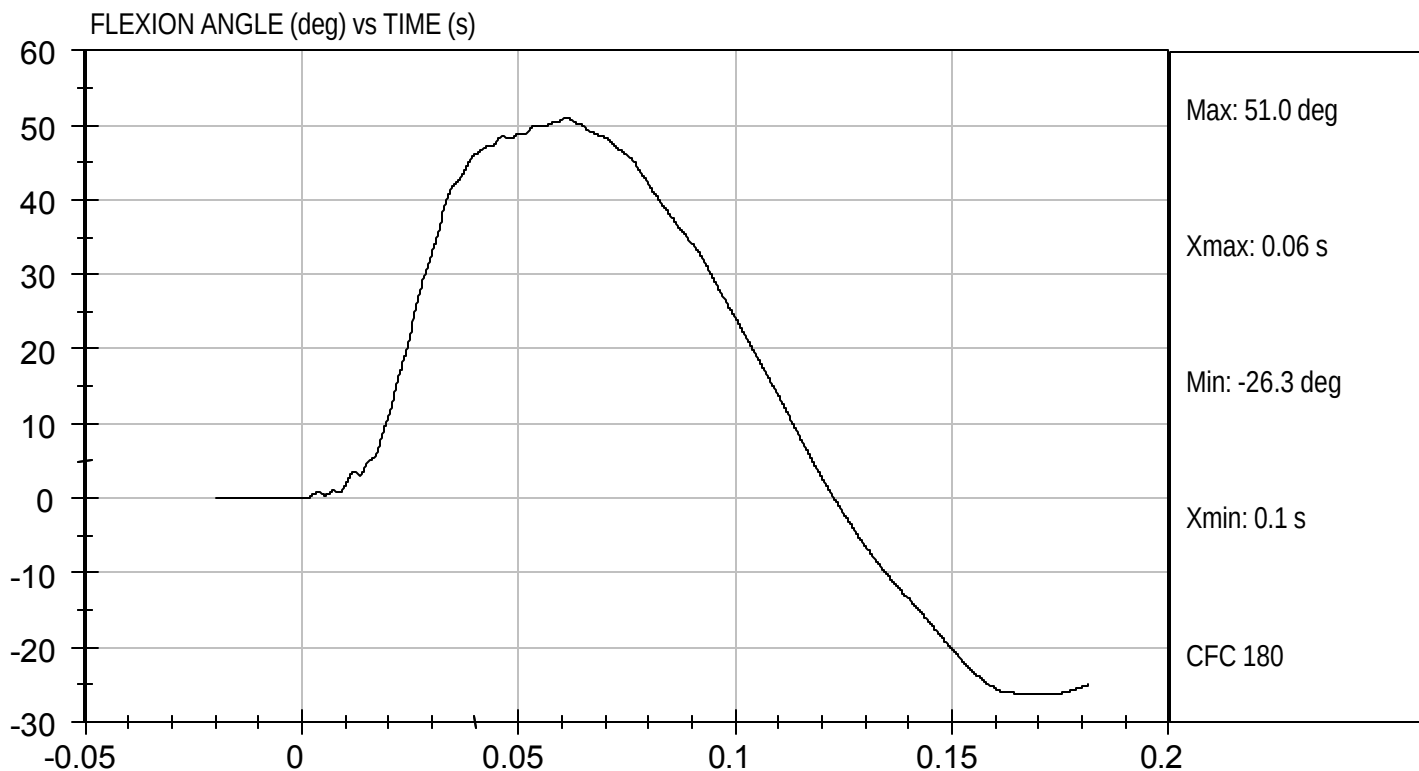
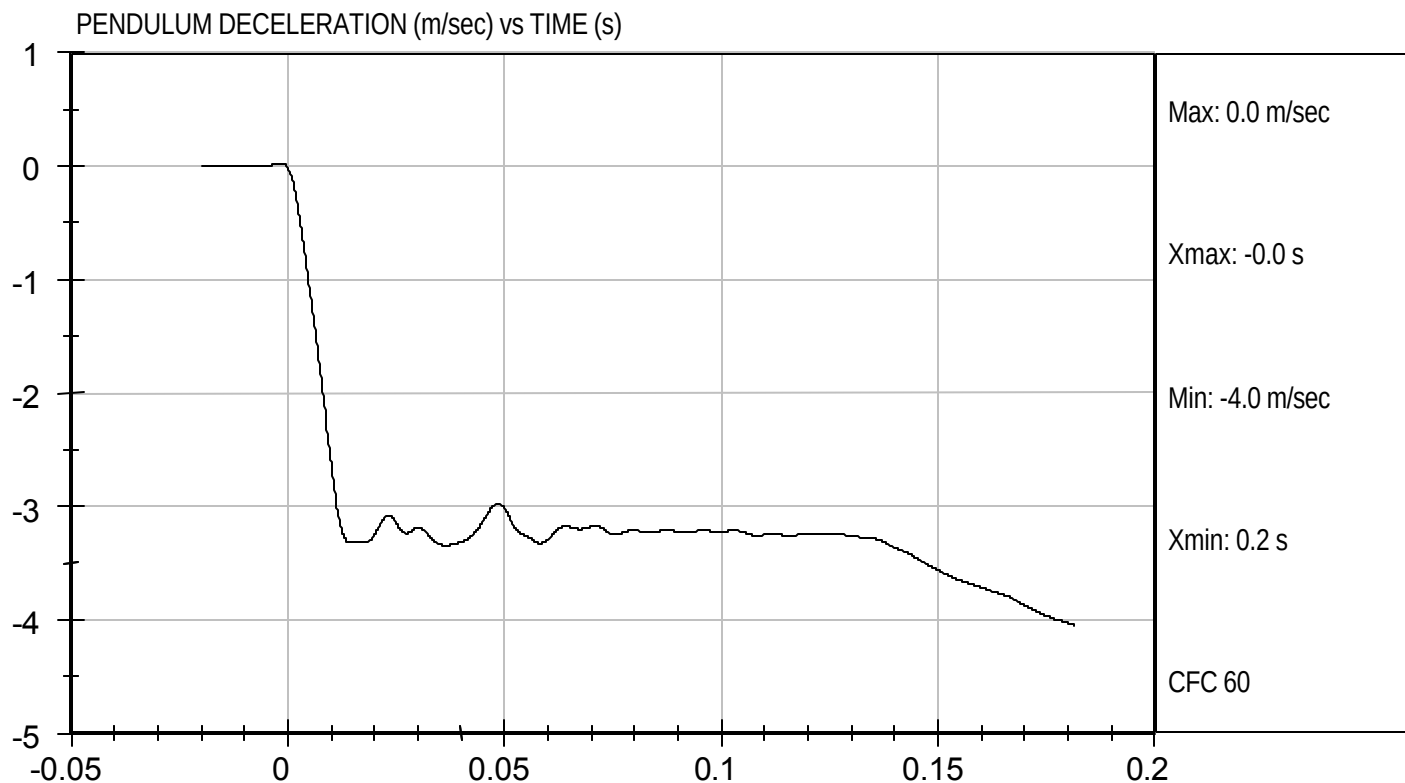
4/23/09  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D09882

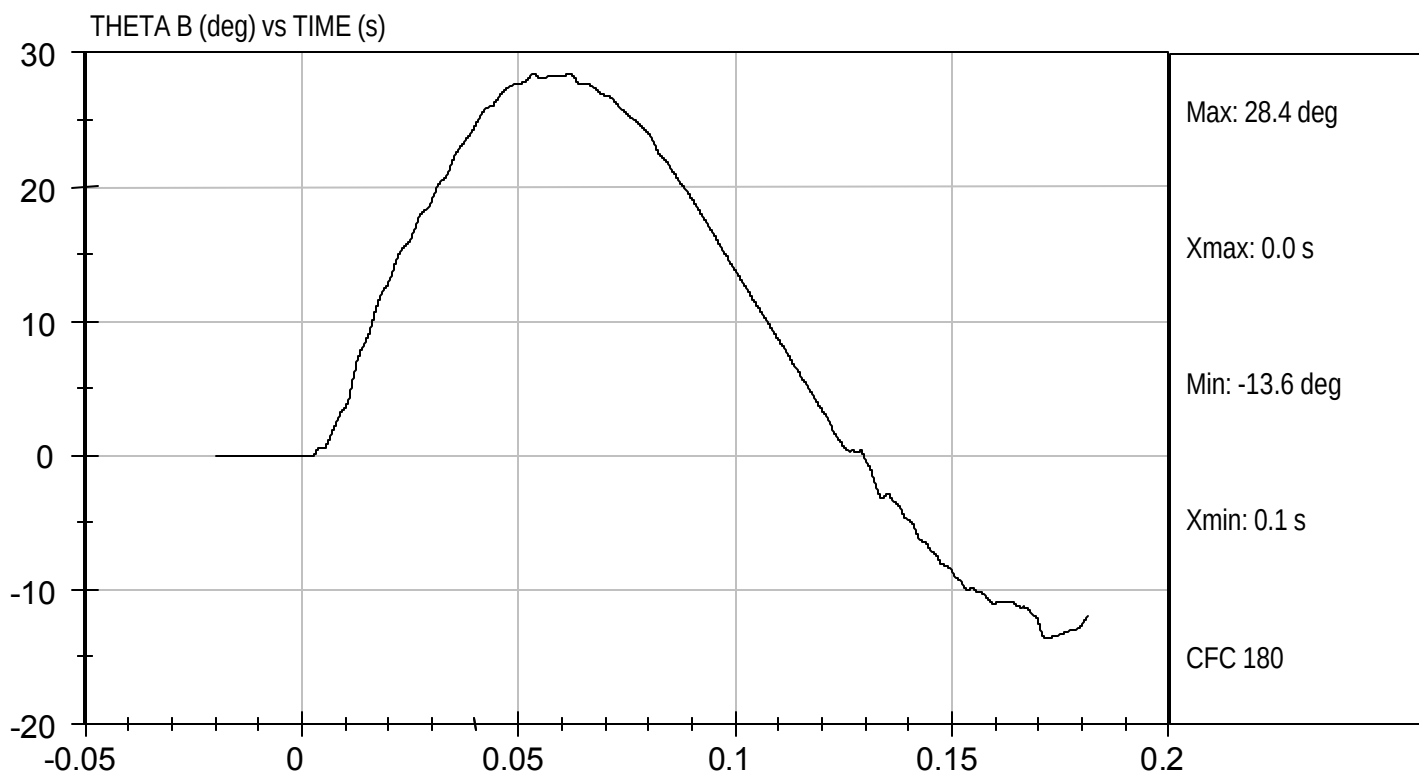
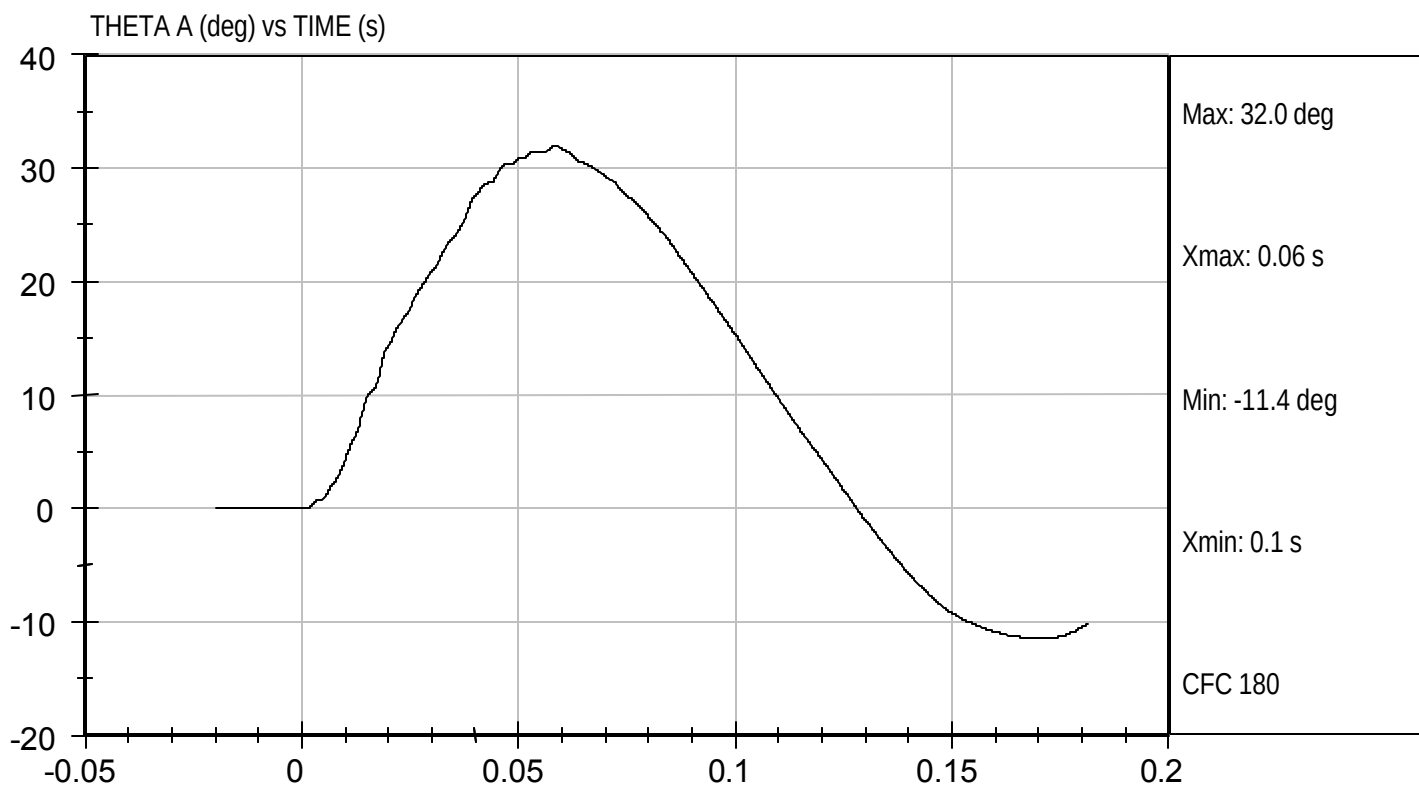
Test Date: 4/23/09  
Velocity: 11.26 ft/s, 3.4 m/s





Test Desc: Neck Bending  
Component ID: D09882

Test Date: 4/23/09  
Velocity: 11.26 ft/s, 3.4 m/s

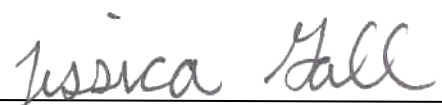


**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09883

| Tested Parameter                   | Units | Specification | Result | Pass/Fail |
|------------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature             | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Laboratory Relative Humidity       | %     | 10 to 70      | 28     | Pass      |
| Pendulum Speed                     | m/s   | 4.2 to 4.4    | 4.3    | Pass      |
| Peak Shoulder Acceleration         | G's   | 7.5 to 10.5   | 9.2    | Pass      |
| Time of Peak Shoulder Acceleration | msec  | NA            | 17.1   | Pass      |
| Overall Test Results               |       |               | Pass   |           |

  
Laboratory Technician

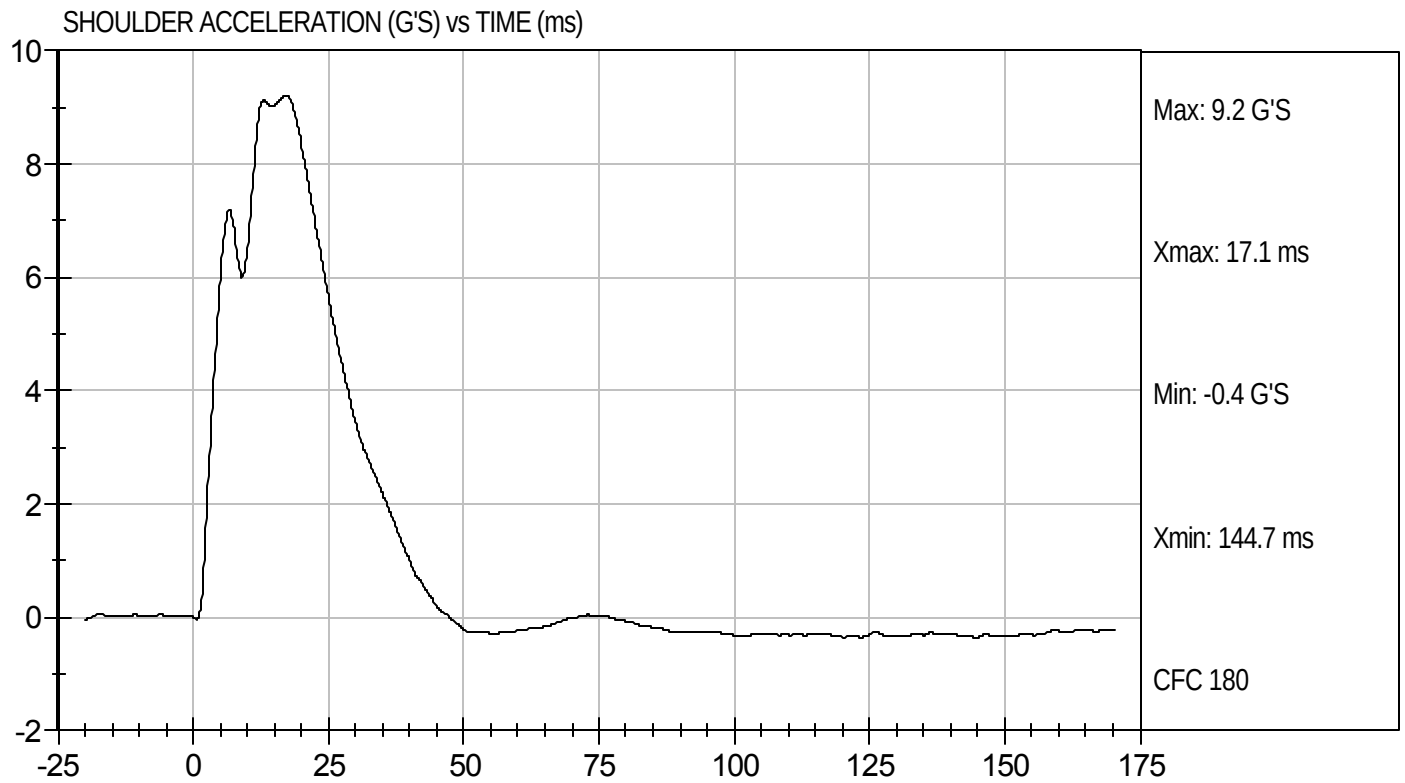
4/23/09  
Test Date

  
Approved By



Test Desc: Shoulder Impact  
Component ID: D09883

Test Date: 4/23/09  
Velocity: 14.0 ft/s, 4.3 m/s



**MGA RESEARCH CORPORATION**

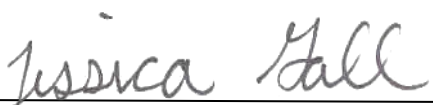
**UPPER RIB TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09884

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 22.1   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 31     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 36.7   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 47.5   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

  
Laboratory Technician

4/23/09  
Test Date

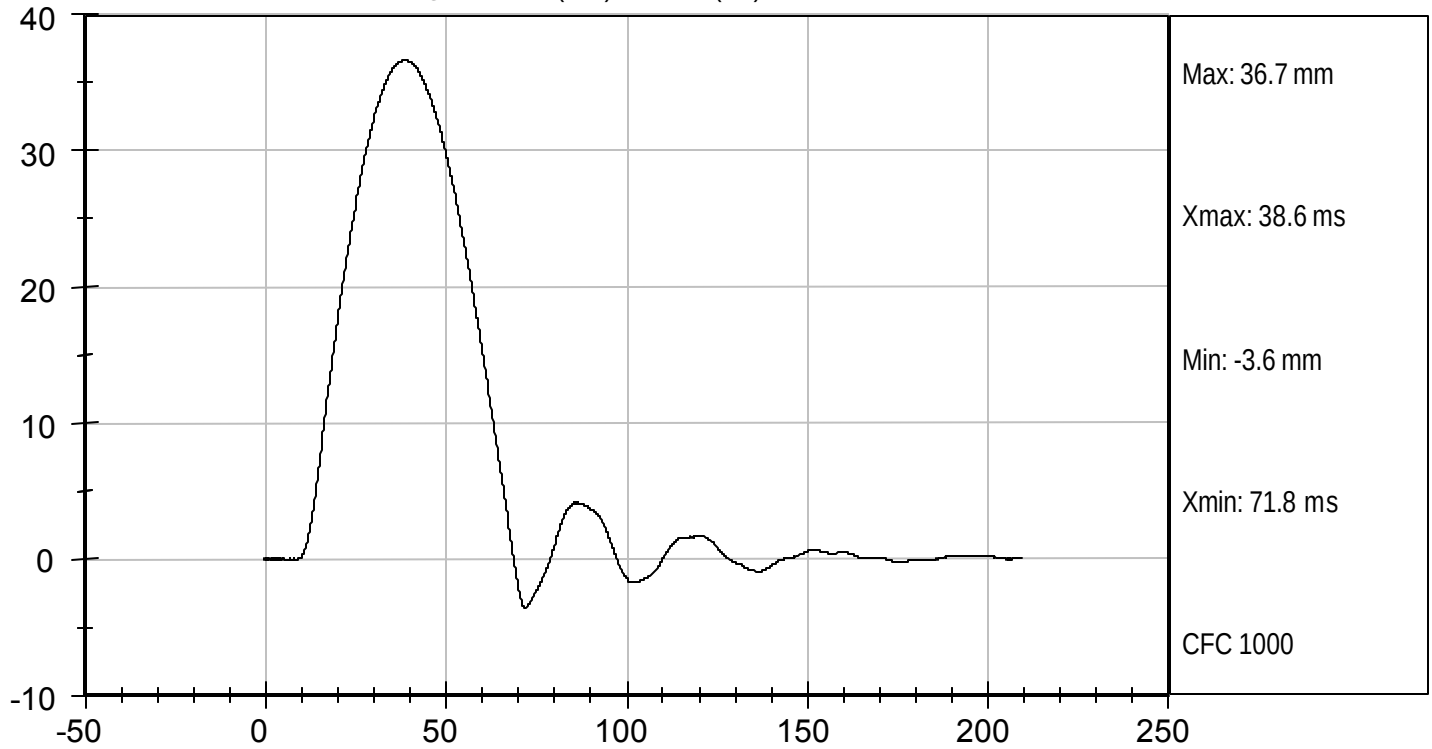
  
Approved By



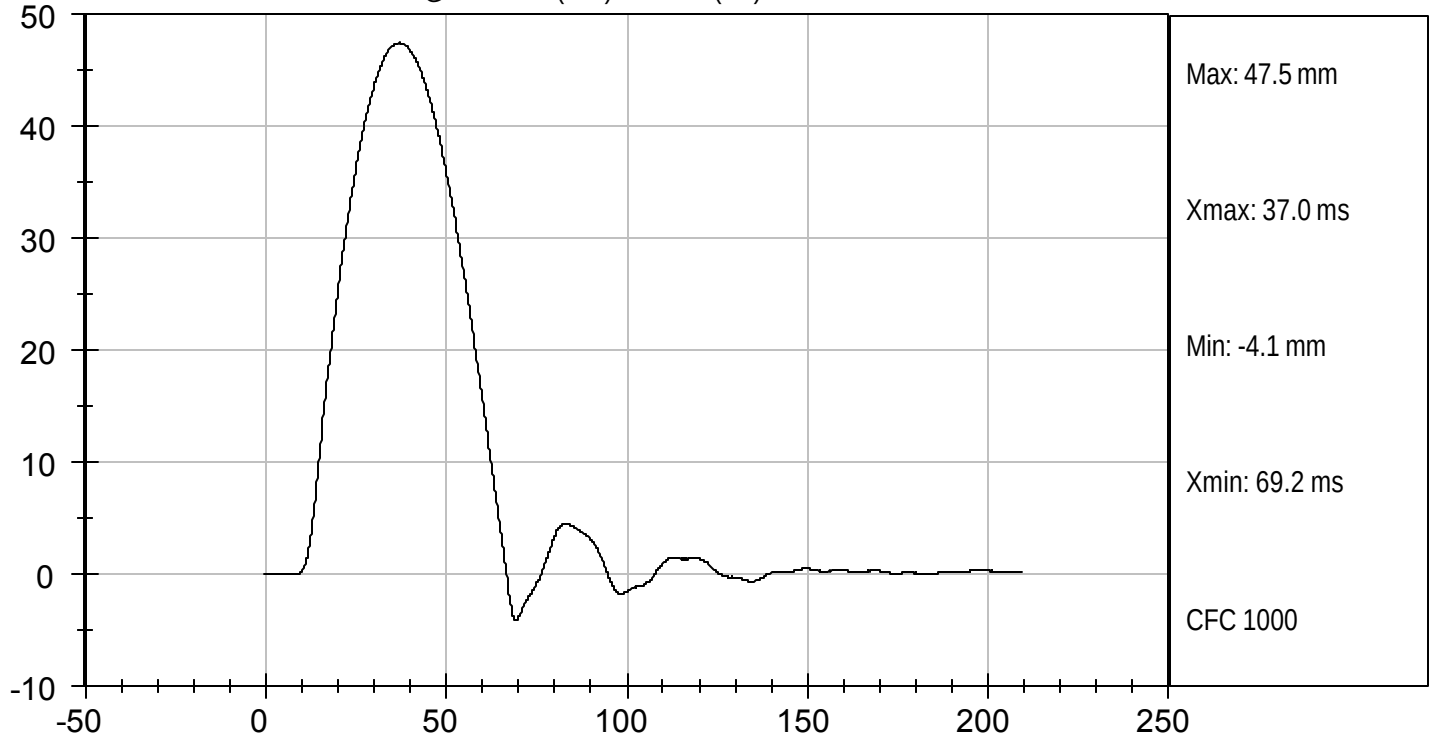
Test Desc: Rib Impact - Upper  
Component ID: D09884

Test Date: 4/23/09

UPPER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



MGA RESEARCH CORPORATION

MID RIB TEST  
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D09885

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 31     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 37.3   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 47.7   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

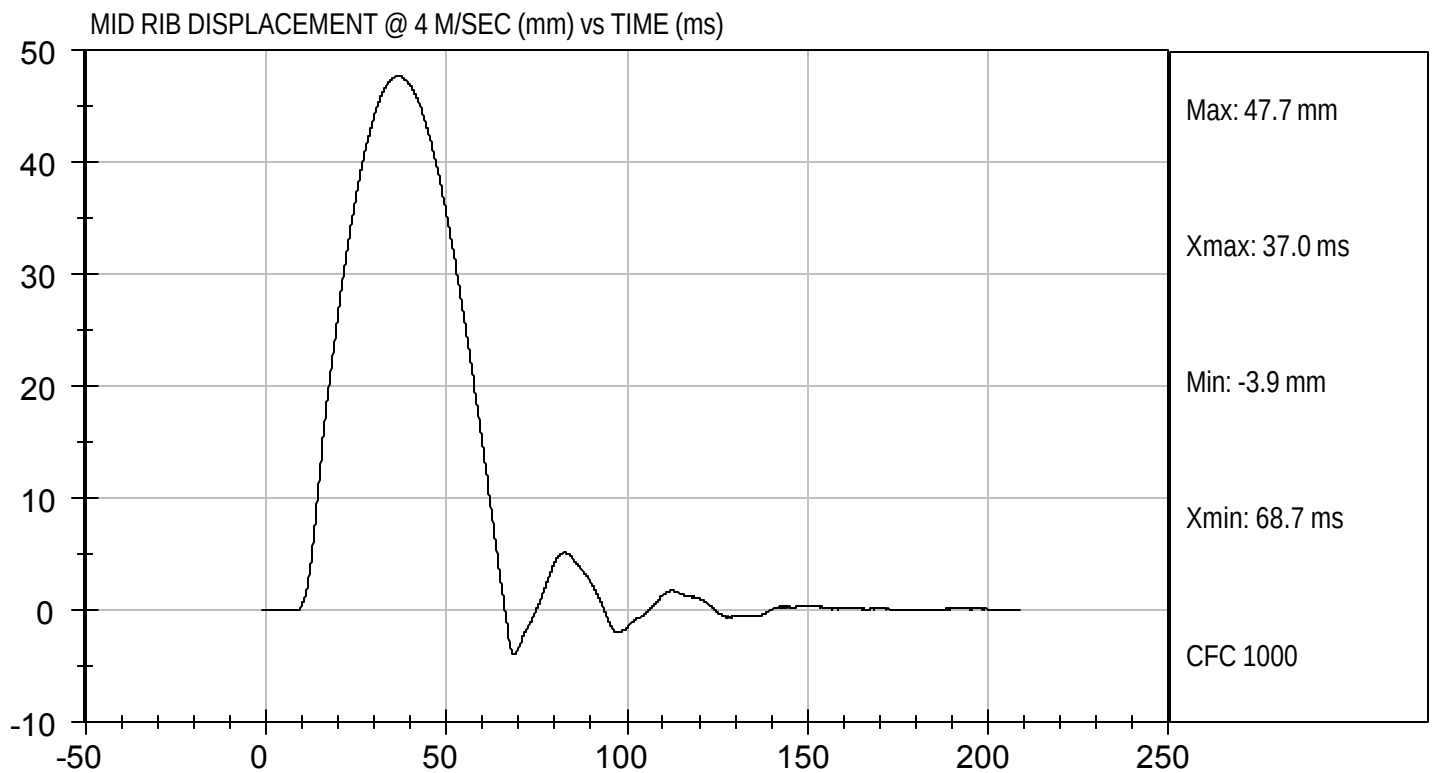
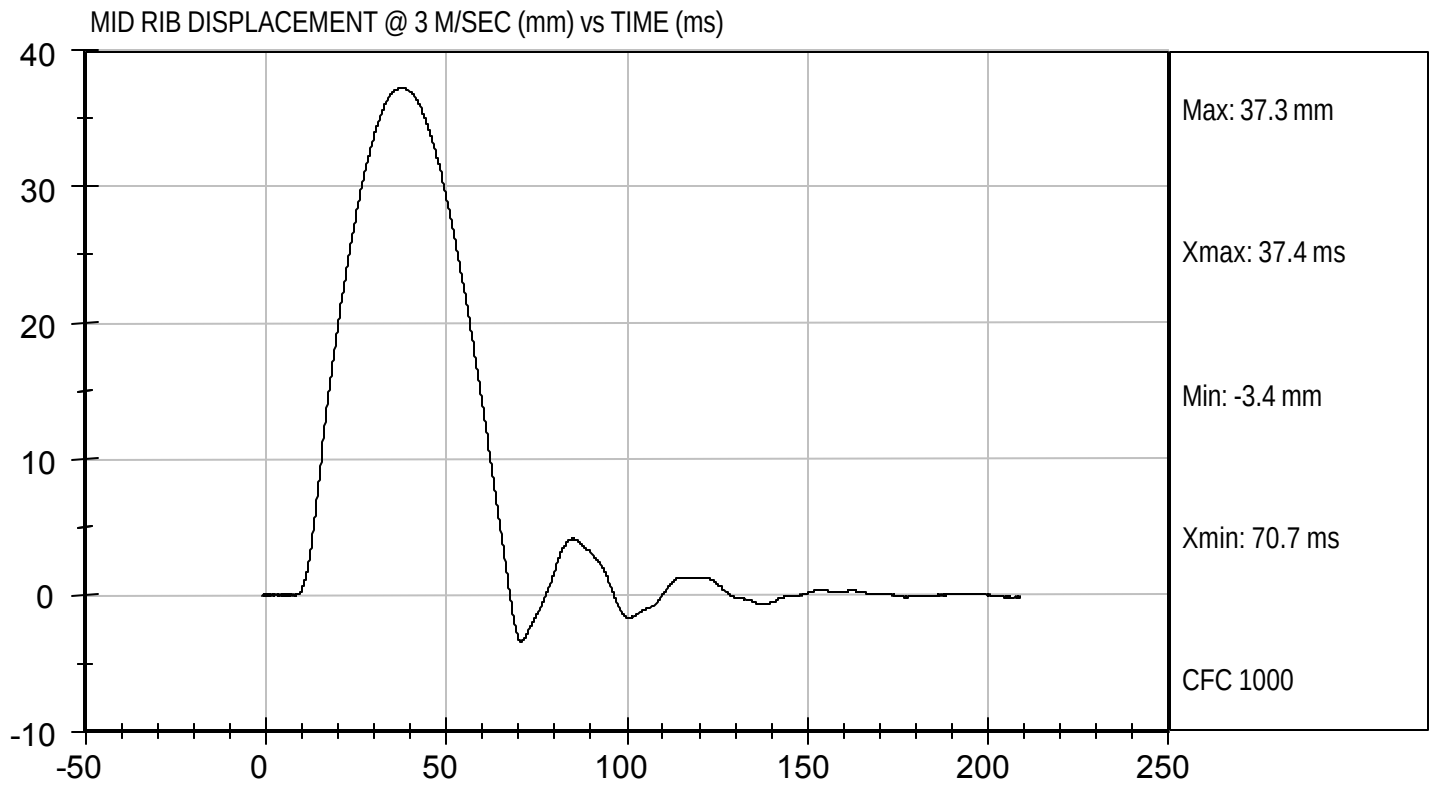
4/23/09  
Test Date

David Winkelbauer  
Approved By



Test Desc: Rib Impact - Mid  
Component ID: D09885

Test Date: 4/23/09



**MGA RESEARCH CORPORATION**

**LOWER RIB TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

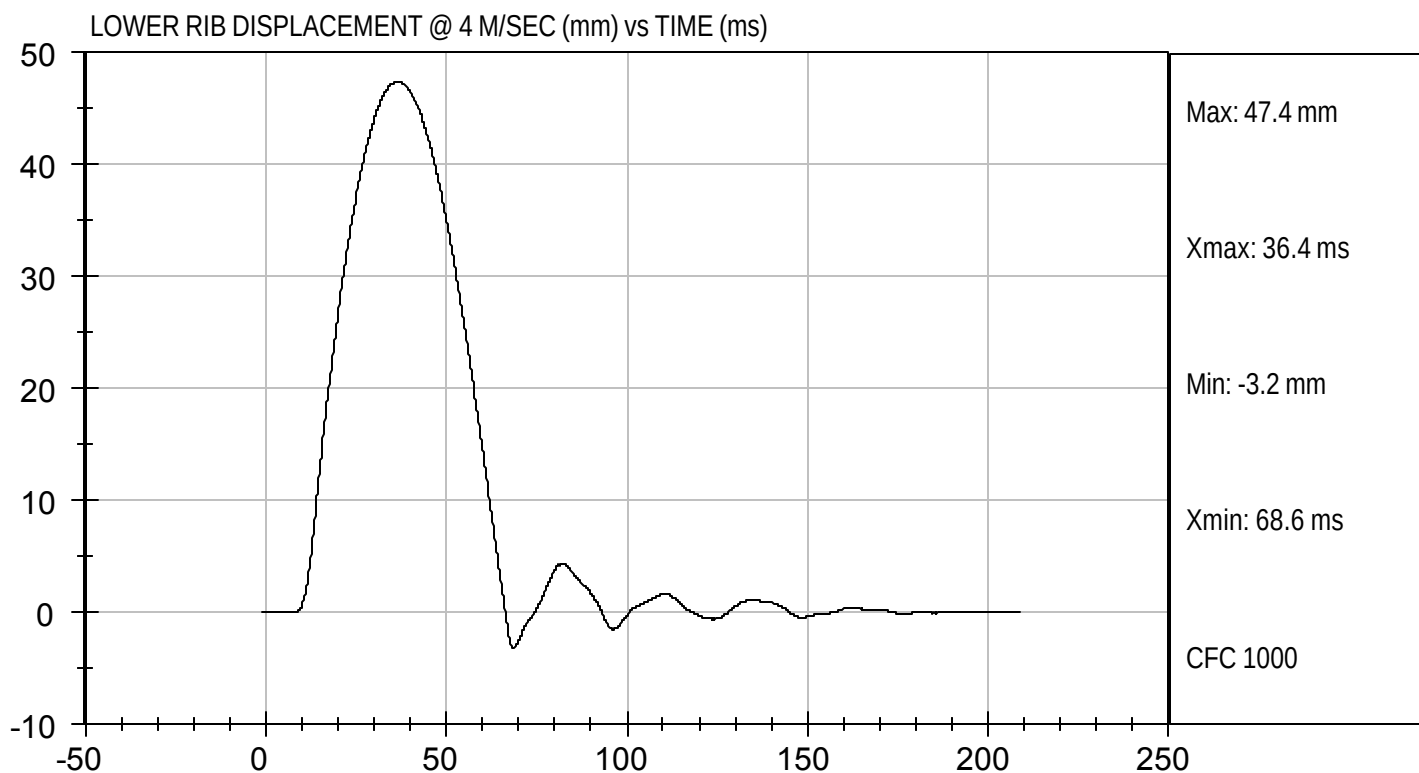
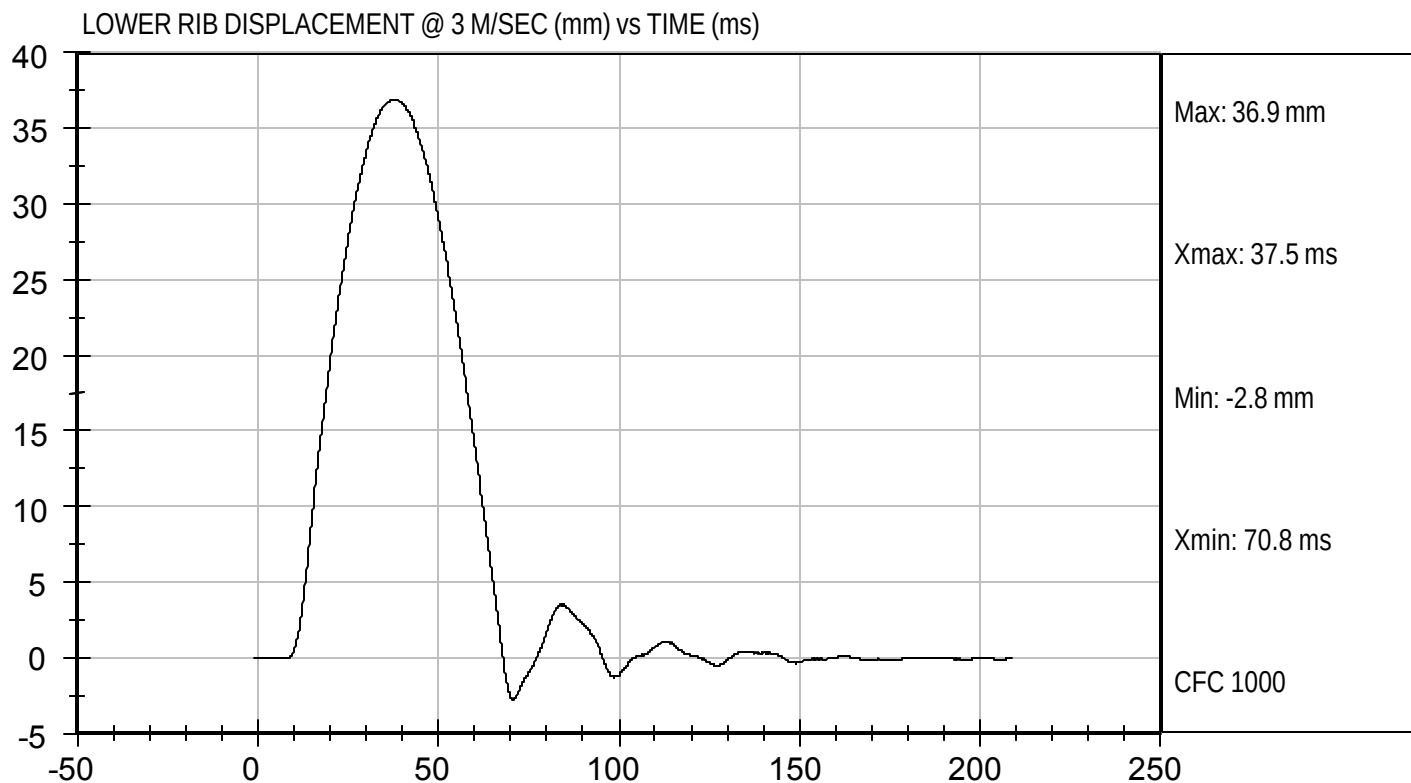
**Test I.D:** D09886

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 31     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 36.9   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 47.4   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

  
Laboratory Technician

4/23/09  
Test Date

  
Approved By



**MGA RESEARCH CORPORATION**

**ABDOMEN TEST**

**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09887

| Tested Parameter               | Units | Specification  | Result | Pass/Fail |
|--------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2   | 21.3   | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70       | 29     | Pass      |
| Probe Speed                    | m/s   | 3.90 to 4.10   | 3.96   | Pass      |
| Maximum Impact Force           | kN    | 4.00 to 4.80   | 4.05   | Pass      |
| Time of Maximum Impactor Force | msec  | 10.60 to 13.00 | 10.80  | Pass      |
| Maximum Total Abdomen Force    | kN    | 2.20 to 2.70   | 2.49   | Pass      |
| Time of Maximum Abdomen Force  | msec  | 10.00 to 12.30 | 10.50  | Pass      |
| Overall Test Results           |       |                |        | Pass      |

  
 Laboratory Technician

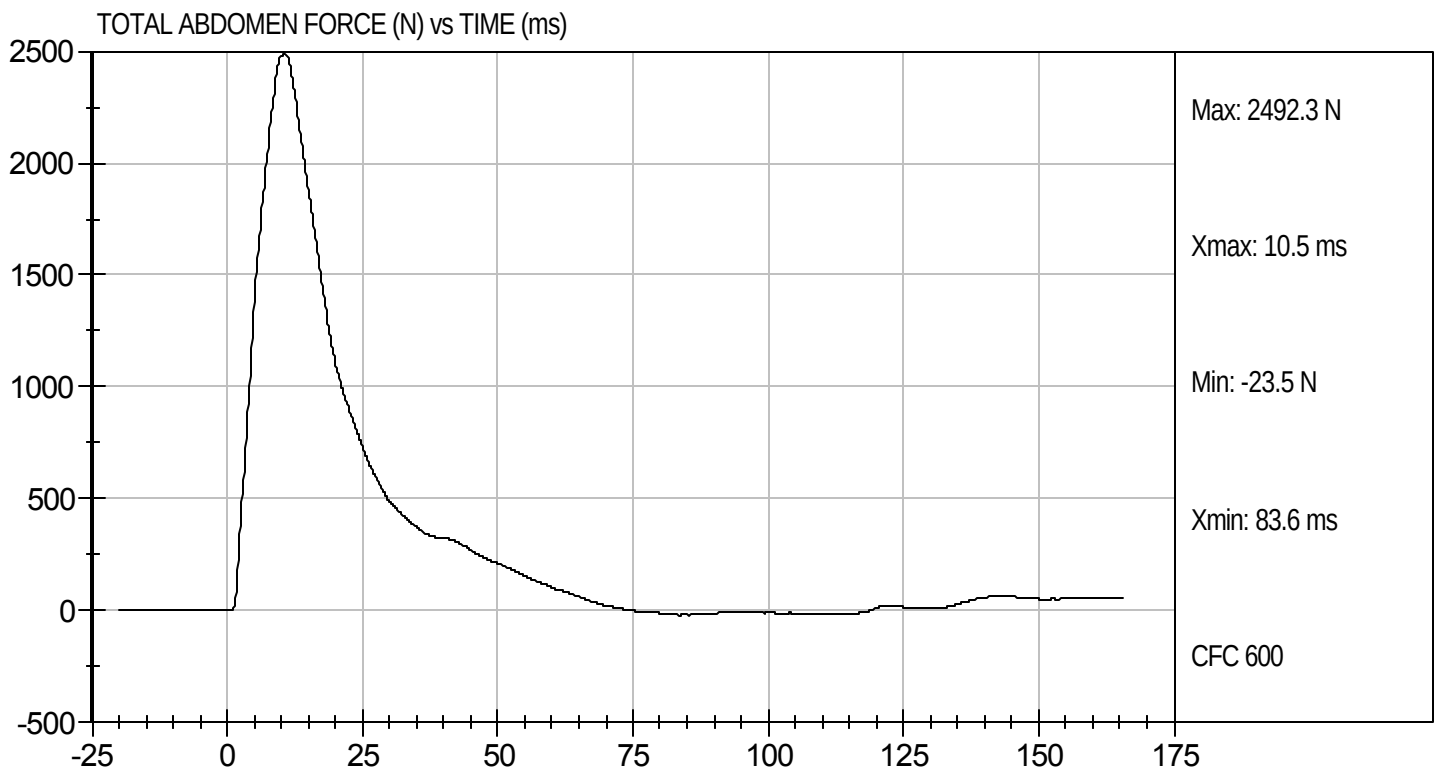
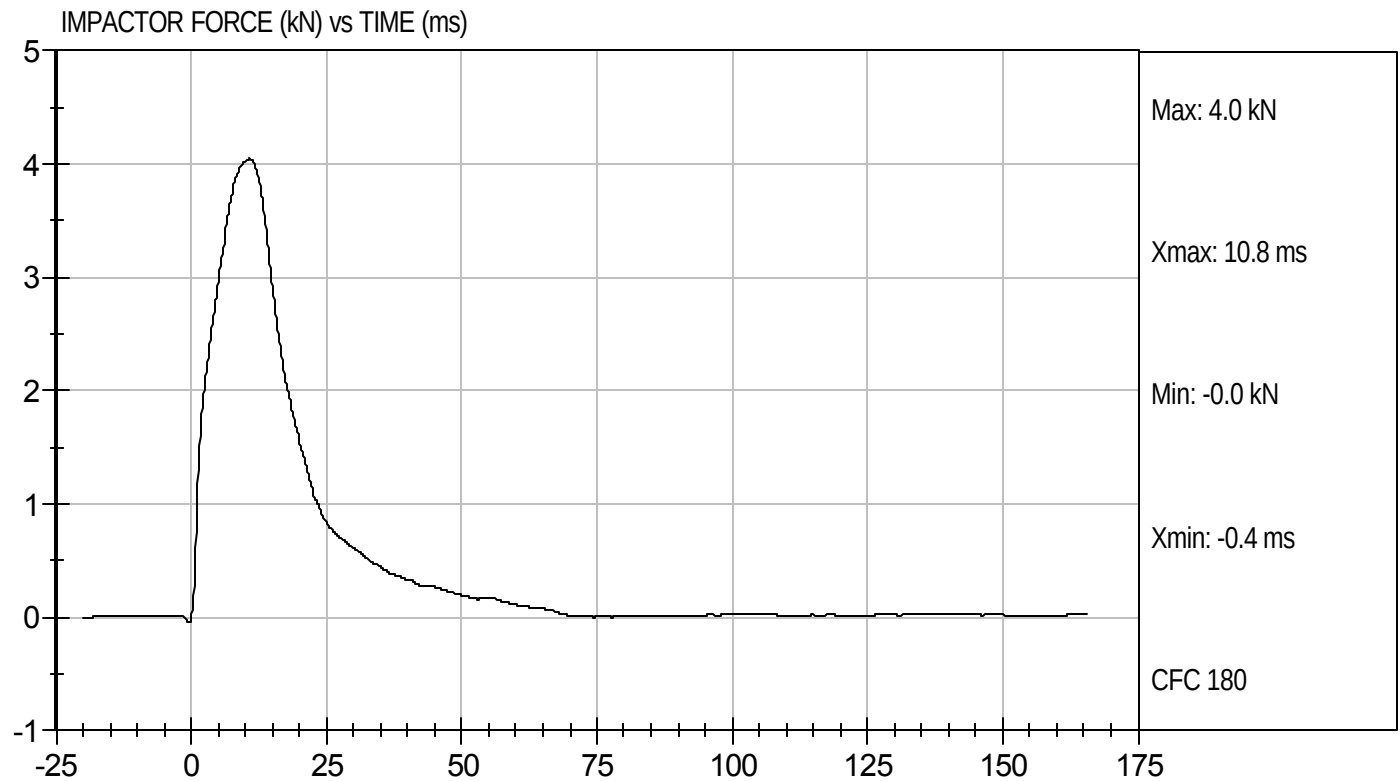
4/23/09  
 Test Date

  
 Approved By



Test Desc: Abdomen Impact  
Component ID: D09887

Test Date: 4/23/09  
Velocity: 13.0 ft/s, 3.96 m/s

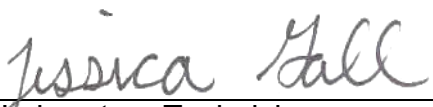


**MGA RESEARCH CORPORATION**  
**LUMBAR SPINE TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09888

| Tested Parameter                            |          | Units | Specification   | Result | Pass/Fail |
|---------------------------------------------|----------|-------|-----------------|--------|-----------|
| Laboratory Temperature                      |          | deg C | 20.6 to 22.2    | 21.5   | Pass      |
| Laboratory Relative Humidity                |          | %     | 10 to 70        | 30     | Pass      |
| Pendulum Speed                              |          | m/sec | 5.95 to 6.15    | 6.12   | Pass      |
| Pendulum Deceleration                       | 1 msec   | m/sec | -0.05 to 0.00   | -0.02  | Pass      |
|                                             | 3.7 msec | m/sec | -0.425 to -0.24 | -0.41  | Pass      |
|                                             | 27 msec  | m/sec | -6.50 to -5.80  | -6.00  | Pass      |
|                                             | 30 msec  | m/sec | >= -6.5         | -5.98  | Pass      |
| Maximum Flexion Angle                       |          | deg   | 45.0 to 55.0    | 45.4   | Pass      |
| Time of Maximum Flexion Angle               |          | msec  | 39.0 to 53.0    | 44.5   | Pass      |
| Headform Rotation Decay to Initial Position |          | msec  | 37 to 57        | 42     | Pass      |
| Overall Results                             |          |       |                 | Pass   |           |

  
 Laboratory Technician

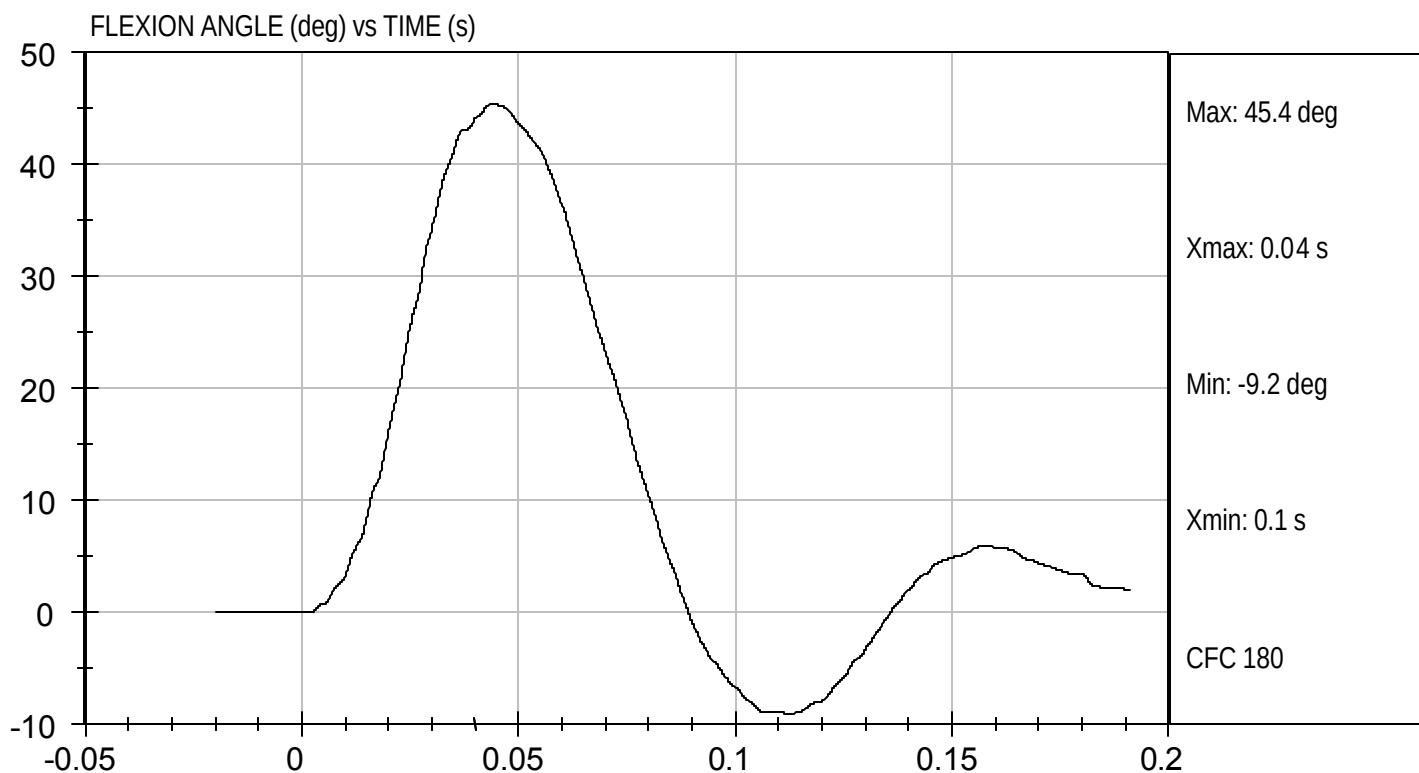
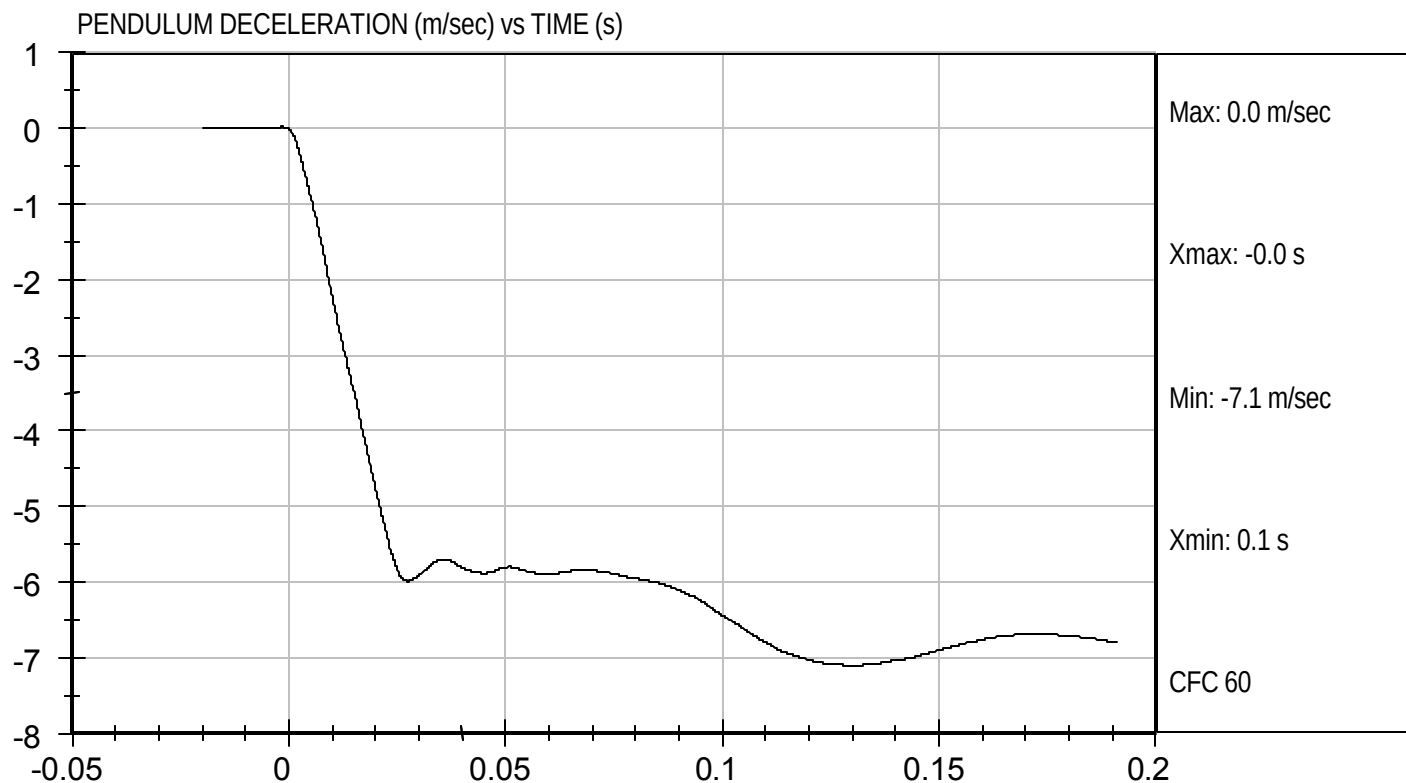
4/23/09  
 Test Date

  
 Approved By



Test Desc: Lumbar Bending  
Component ID: D09888

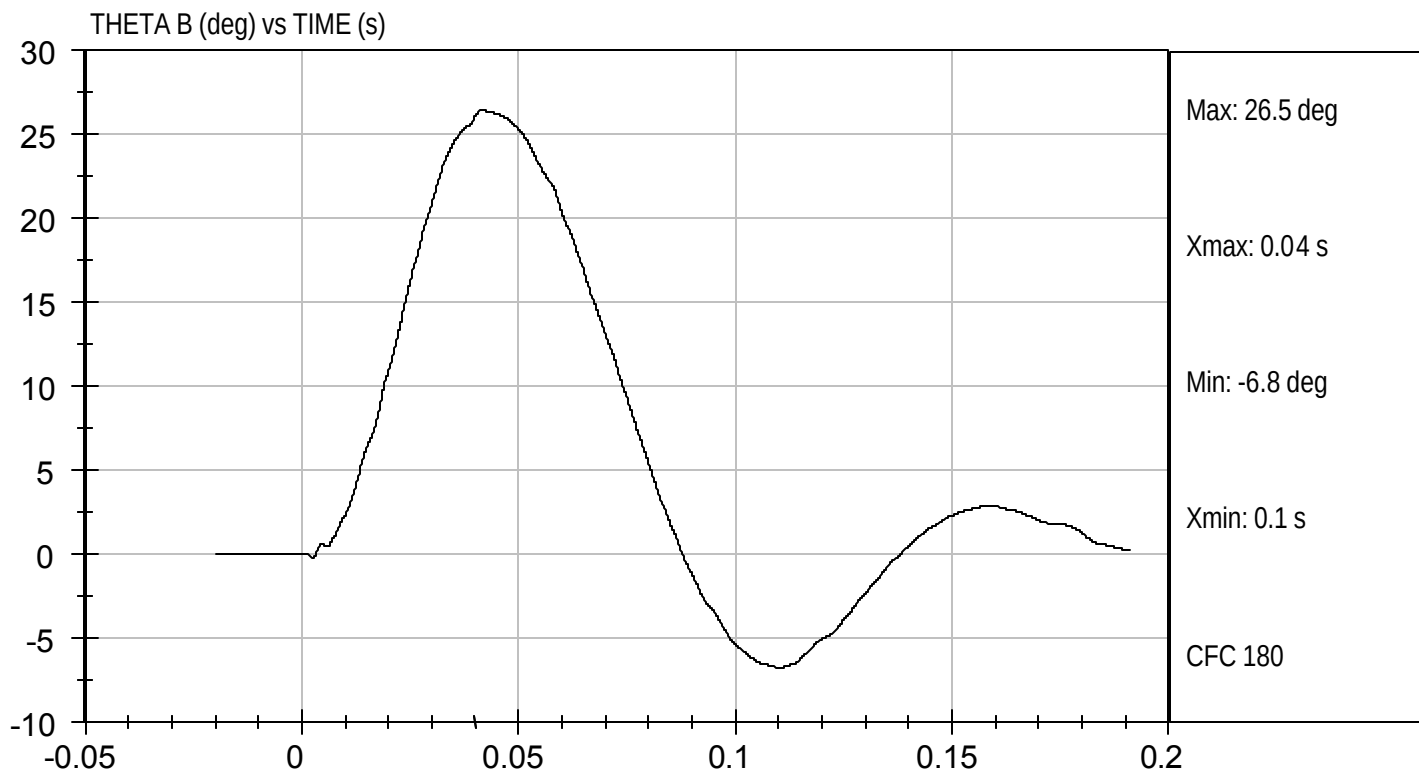
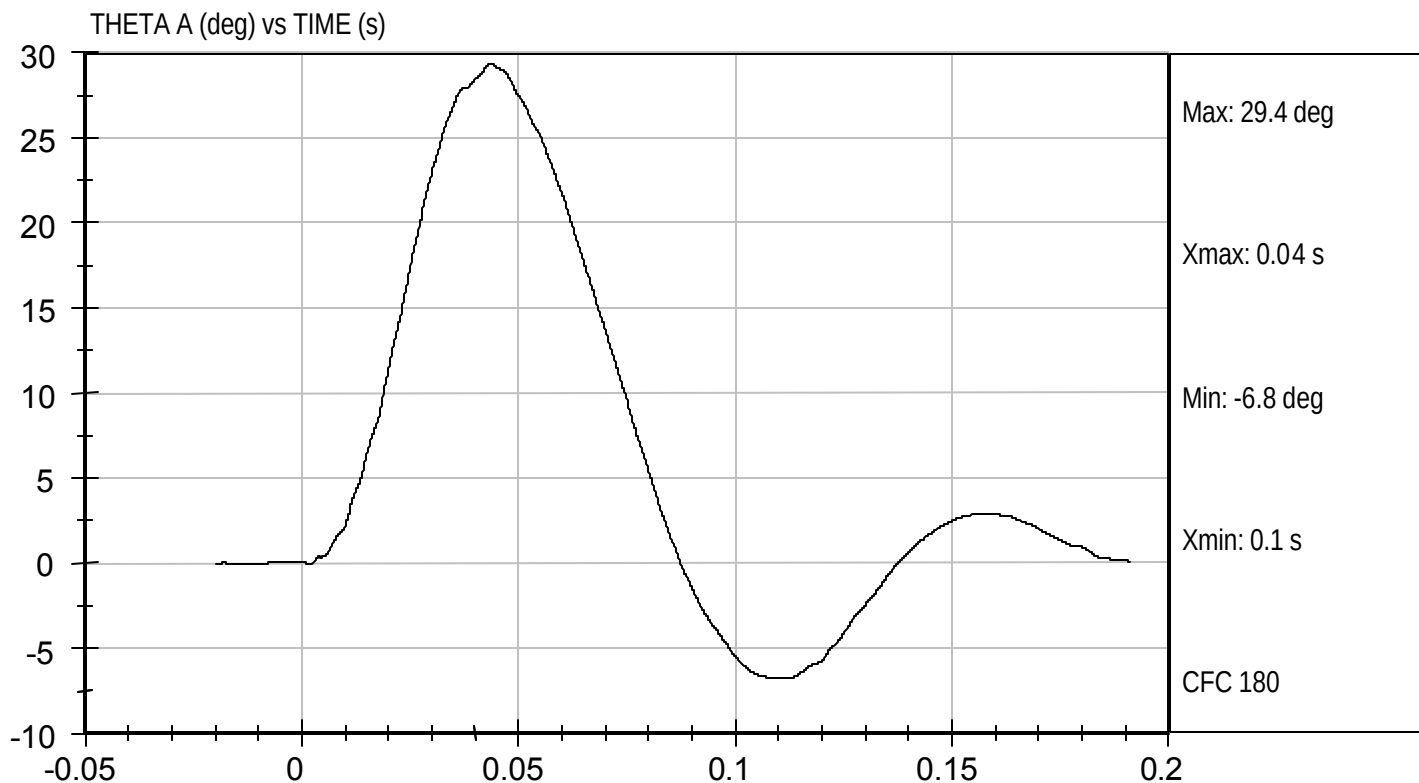
Test Date: 4/23/09  
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Lumbar Bending  
Component ID: D09888

Test Date: 4/23/09  
Velocity: 20.08 ft/s, 6.12 m/s



## MGA RESEARCH CORPORATION

PELVIS TEST  
ES-2re DUMMYATD Serial No: 032Test I.D: D09889

| Tested Parameter               | Units | Specification  | Result | Pass/Fail |
|--------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2   | 21.3   | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70       | 27     | Pass      |
| Probe Speed                    | m/s   | 4.20 to 4.40   | 4.30   | Pass      |
| Maximum Impactor Force         | kN    | 4.70 to 5.40   | 4.73   | Pass      |
| Time of Maximum Impactor Force | msec  | 11.80 to 16.10 | 12.70  | Pass      |
| Maximum Pubic Force            | kN    | 1.23 to 1.59   | 1.34   | Pass      |
| Time of Maximum Pubic Force    | msec  | 12.20 to 17.00 | 13.10  | Pass      |
| Overall Test Results           |       |                |        | Pass      |

Jessica Hall  
Laboratory Technician

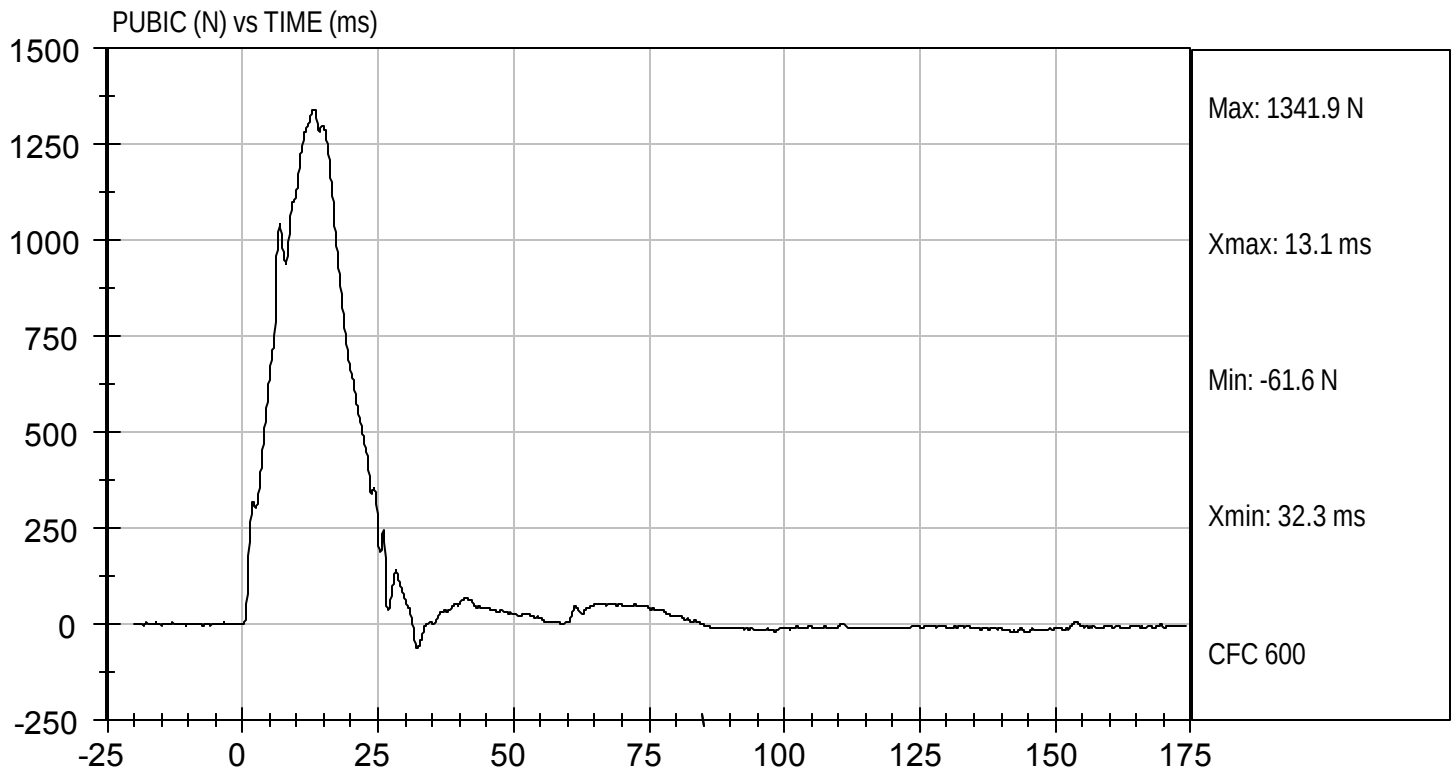
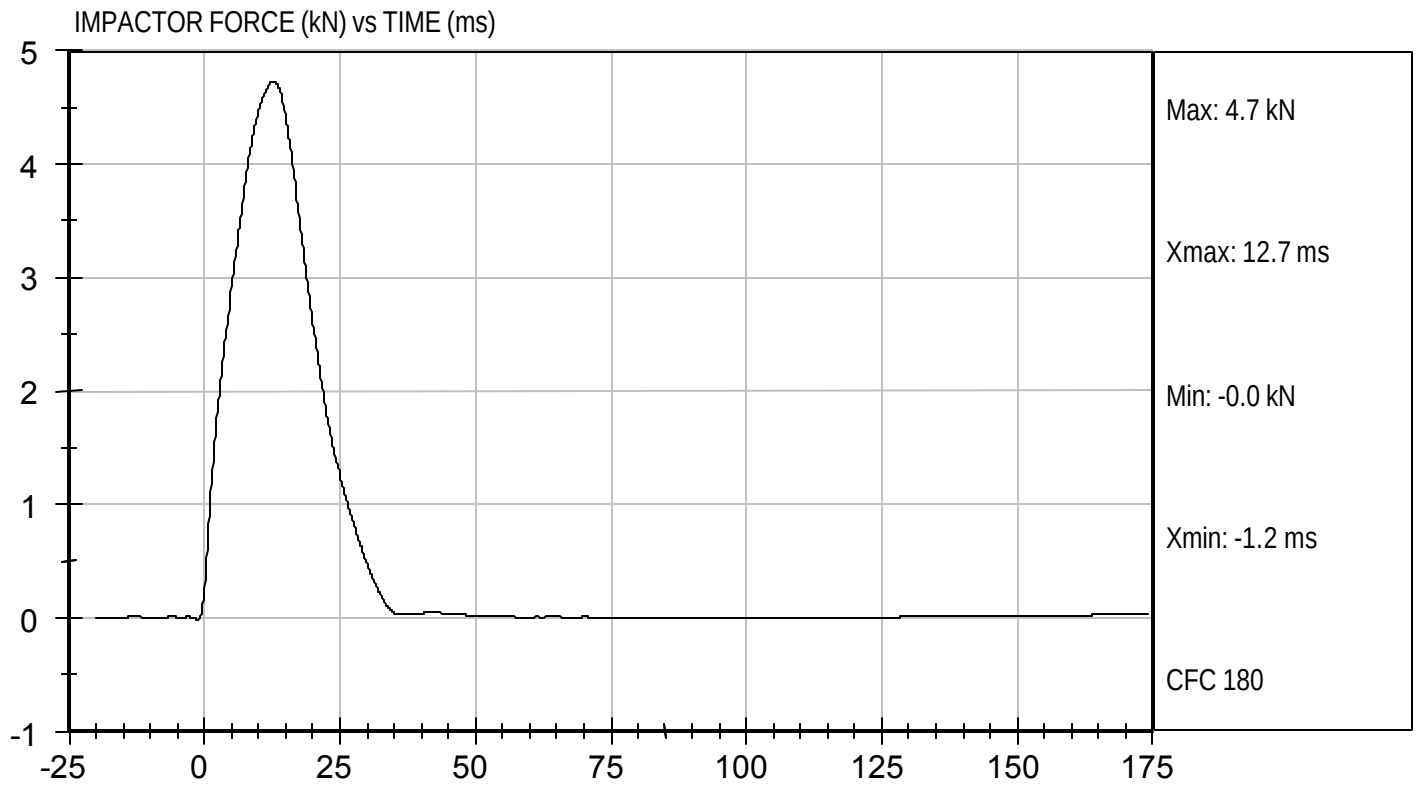
4/23/09  
Test Date

David Winkelbauer  
Approved By



Test Desc: Pelvis Impact  
Component ID: D09889

Test Date: 4/23/09  
Velocity: 14.1 ft/s, 4.30 m/s



**MGA RESEARCH CORPORATION**  
**FULL BODY THORAX IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09880

| Tested Parameter                    | Units | Specification | Result               | Pass/Fail |
|-------------------------------------|-------|---------------|----------------------|-----------|
| Temperature                         | deg C | 20.6 to 22.2  | 21.2                 | Pass      |
| Humidity                            | %     | 10 to 70      | 28                   | Pass      |
| Probe Speed                         | m/s   | 5.40 to 5.60  | 5.58                 | Pass      |
| Maximum Impactor Force (after 6 ms) | kN    | 5.17 to 6.12  | 5.48                 | Pass      |
| Upper Rib Displacement              | mm    | 33.2 to 41.3  | 36.4                 | Pass      |
| Middle Rib Displacement             | mm    | 37.1 to 45.4  | 40.2                 | Pass      |
| Lower Rib Displacement              | mm    | 35.6 to 43.0  | 39.4                 | Pass      |
|                                     |       |               | Overall Test Results | Pass      |

  
Laboratory Technician

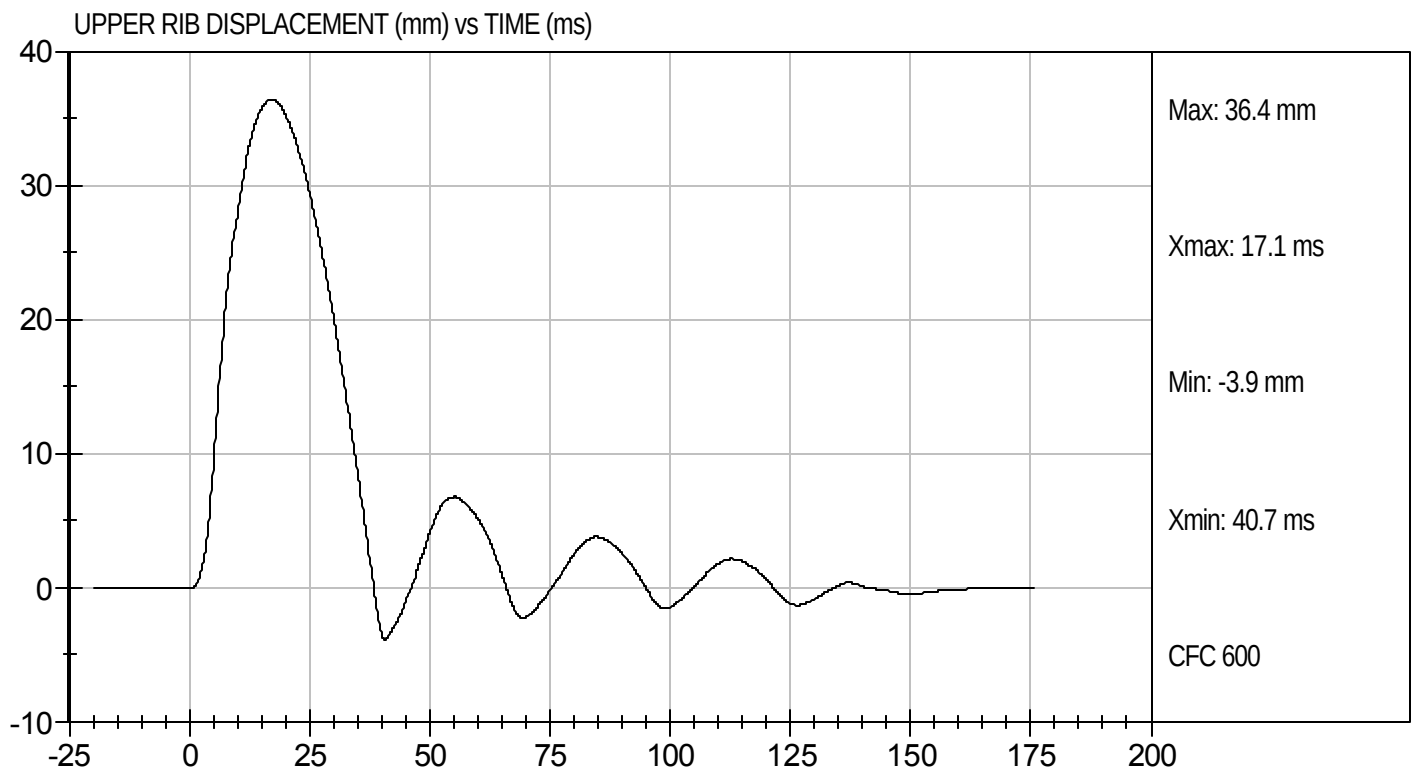
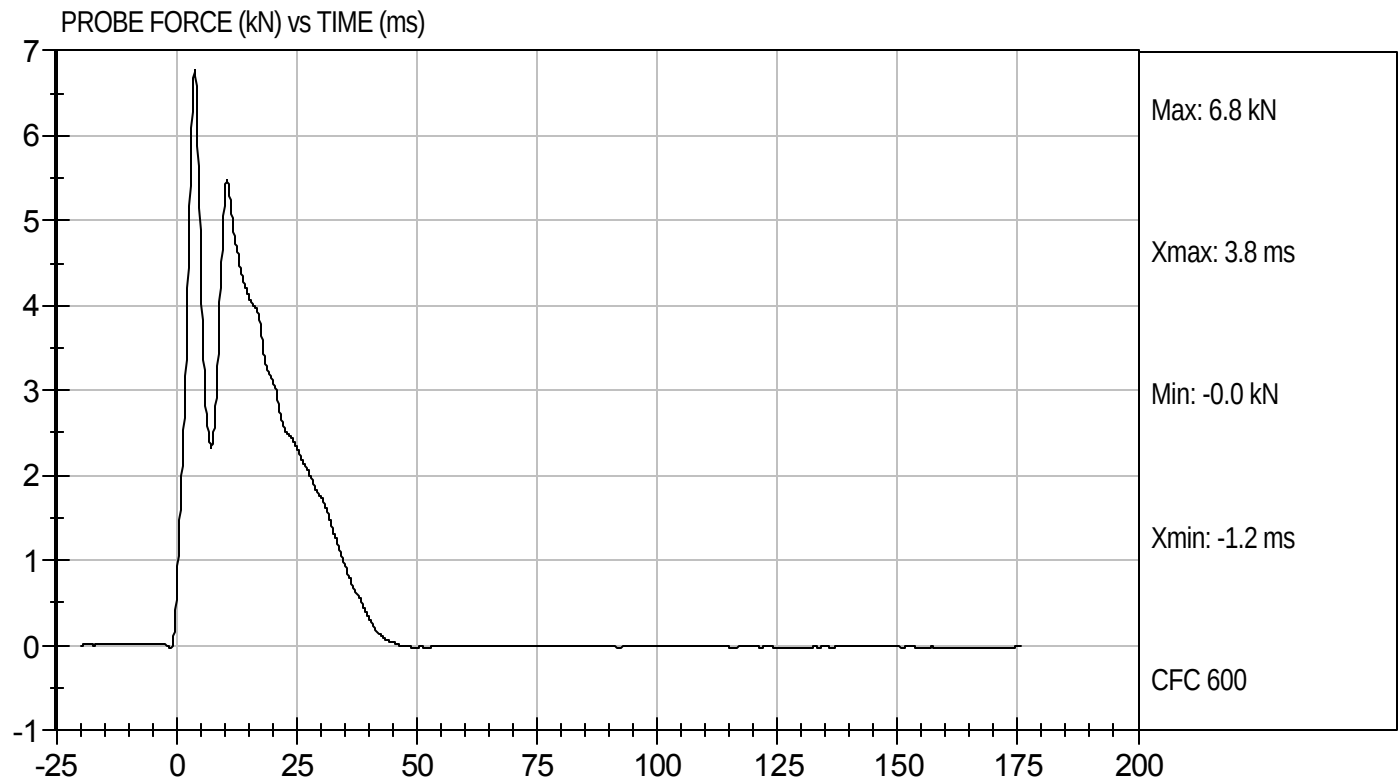
4/23/09  
Test Date

  
Approved By



Test Desc: Thorax Without Arm  
Component ID: D09880

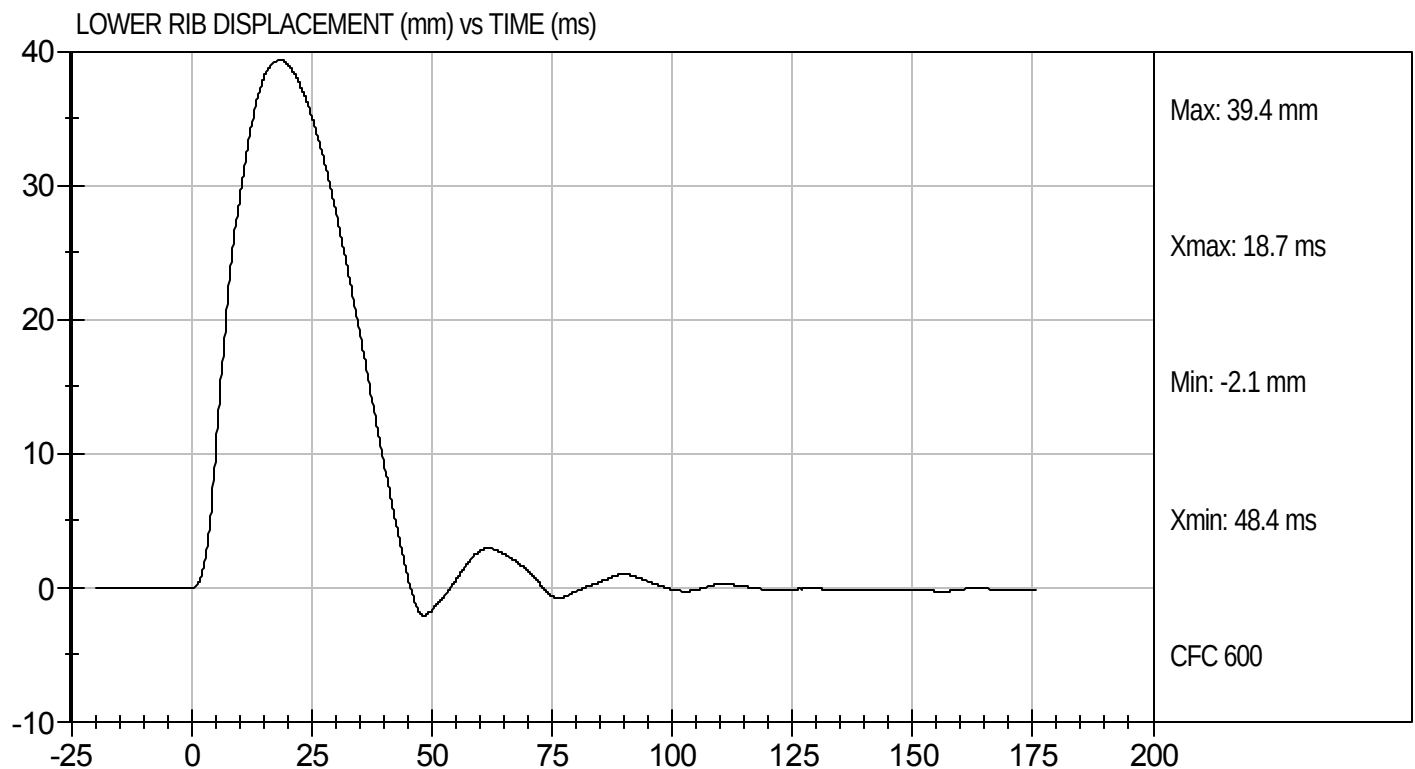
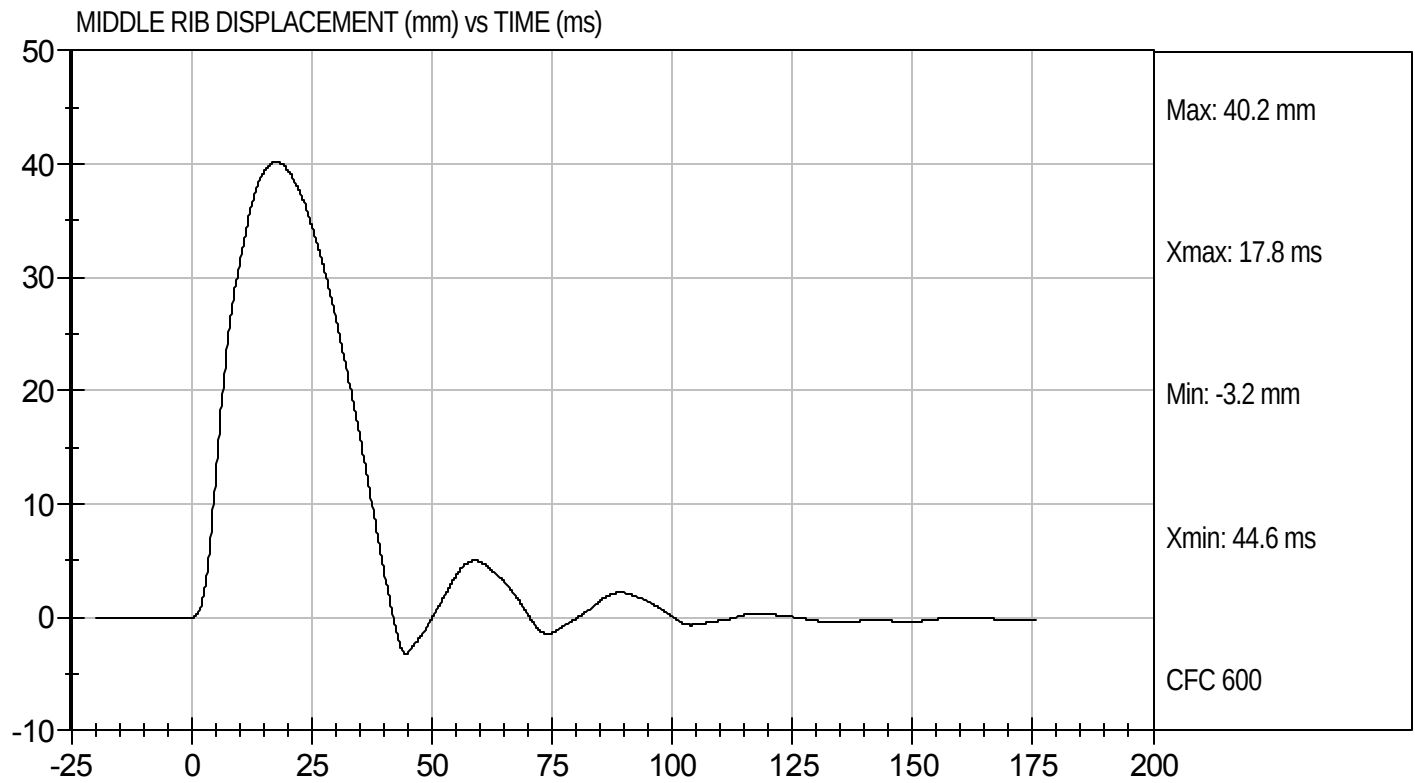
Test Date: 4/23/09  
Velocity: 18.3 ft/s, 5.58 m/s





Test Desc: Thorax Without Arm  
Component ID: D09880

Test Date: 4/23/09  
Velocity: 18.3 ft/s, 5.58 m/s



**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test ID:** D09991

| Tested Parameter             | Units | Specification      | Result | Pass/Fail |
|------------------------------|-------|--------------------|--------|-----------|
| Laboratory Temperature       | deg C | 18.9 to 25.6       | 21.3   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70           | 50     | Pass      |
| Peak Resultant Acceleration  | G's   | 125 to 155         | 141    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15             | -6.6   | Pass      |
| Unimodal                     | N/A   | Yes                | Yes    | Pass      |
| Oscillations                 | N/A   | within 15% of peak | Yes    | Pass      |
| Overall Test Results         |       |                    |        | Pass      |

  
Laboratory Technician

4/30/09  
Test Date

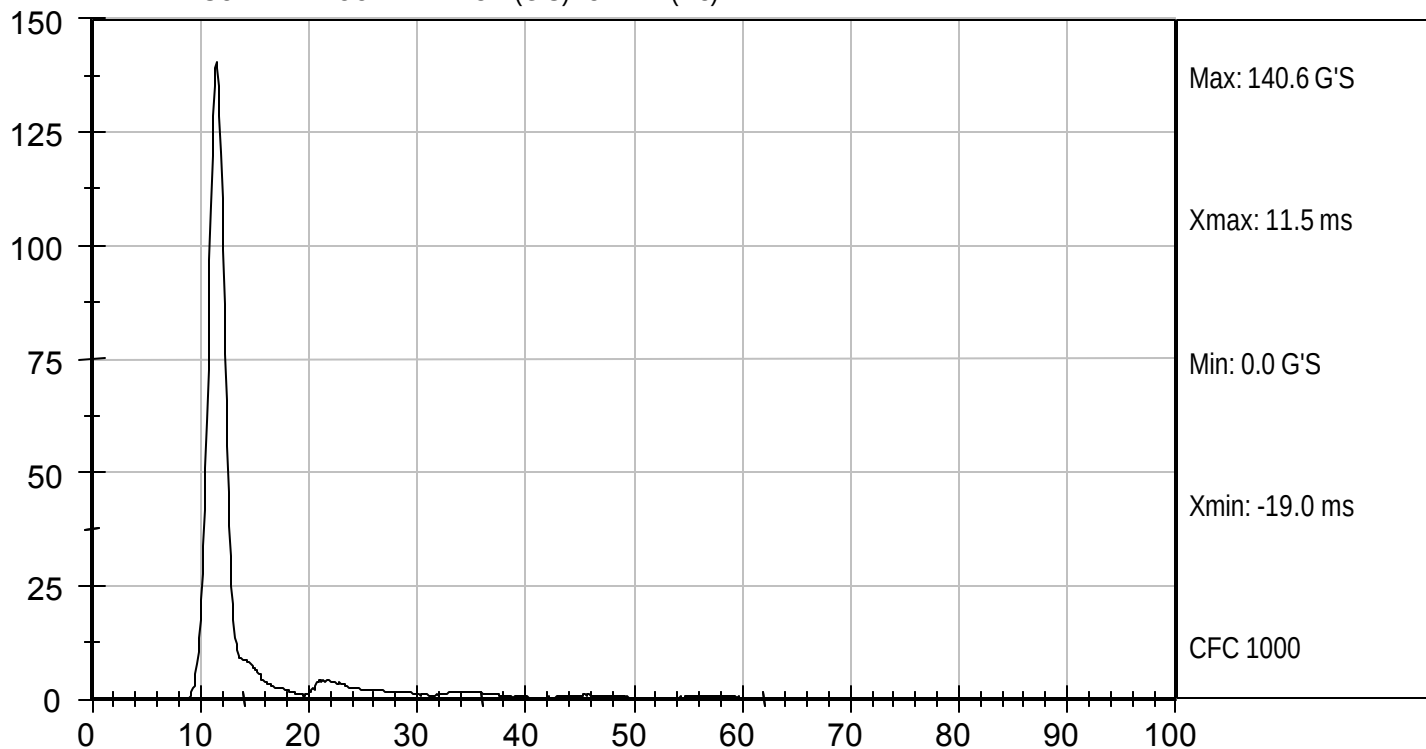
  
Approved By



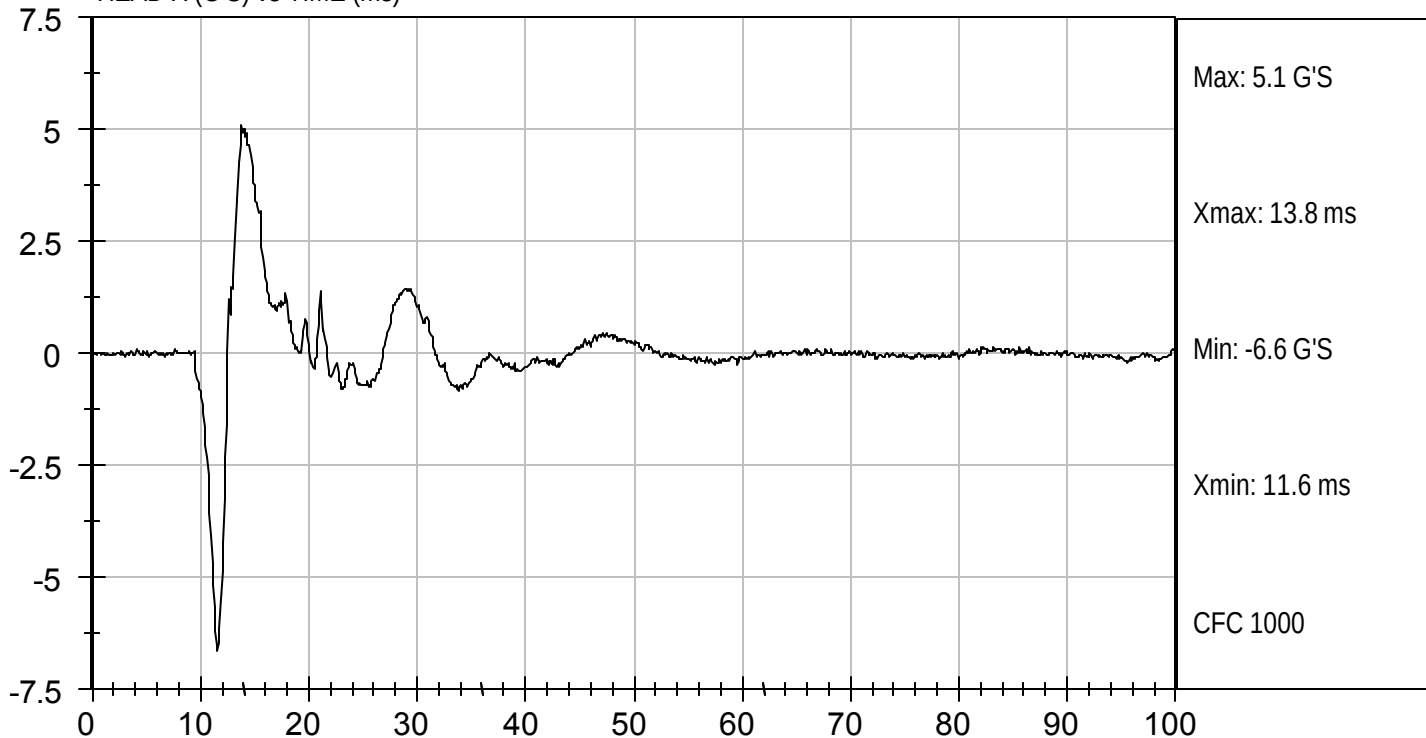
Test Desc: Head Drop  
Component ID: D09991

Test Date: 4/30/09  
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (ms)



HEAD X (G'S) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**NECK PENDULUM TEST**  
**ES-2re DUMMY**

ATD Serial No: 032

Test I.D: D09992

| Tested Parameter                     |         | Units | Specification   | Result | Pass/Fail |
|--------------------------------------|---------|-------|-----------------|--------|-----------|
| Laboratory Temperature               |         | deg C | 18.0 to 22.0    | 21.3   | Pass      |
| Laboratory Relative Humidity         |         | %     | 10 to 70        | 48     | Pass      |
| Pendulum Speed                       |         | m/s   | 3.3 to 3.5      | 3.5    | Pass      |
| Pendulum Deceleration                | 1 msec  | G's   | 0.00 to -0.05   | -0.14  | Pass      |
|                                      | 3 msec  | G's   | -0.25 to -0.375 | -0.31  | Pass      |
|                                      | 14 msec | G's   | -3.20 to -3.70  | -3.34  | Pass      |
| Maximum Flexion Angle                |         | deg   | 49.0 to 59.0    | 53.8   | Pass      |
| Time of Maximum Flexion Angle        |         | msec  | 54.0 to 66.0    | 60.5   | Pass      |
| Head Rotation Decay Time to 0 degree |         | msec  | 53 to 88        | 62     | Pass      |
| Overall Test Results                 |         |       |                 | Pass   |           |

  
 Laboratory Technician

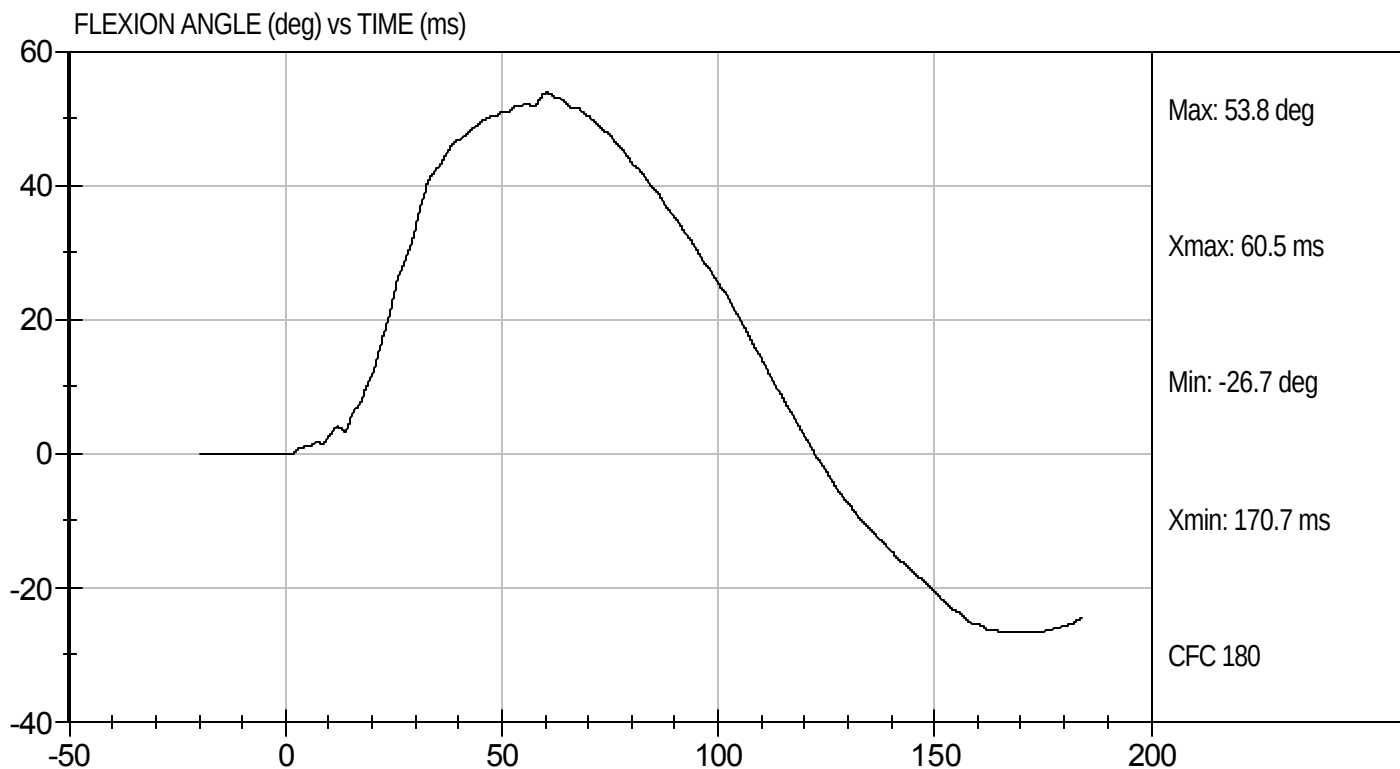
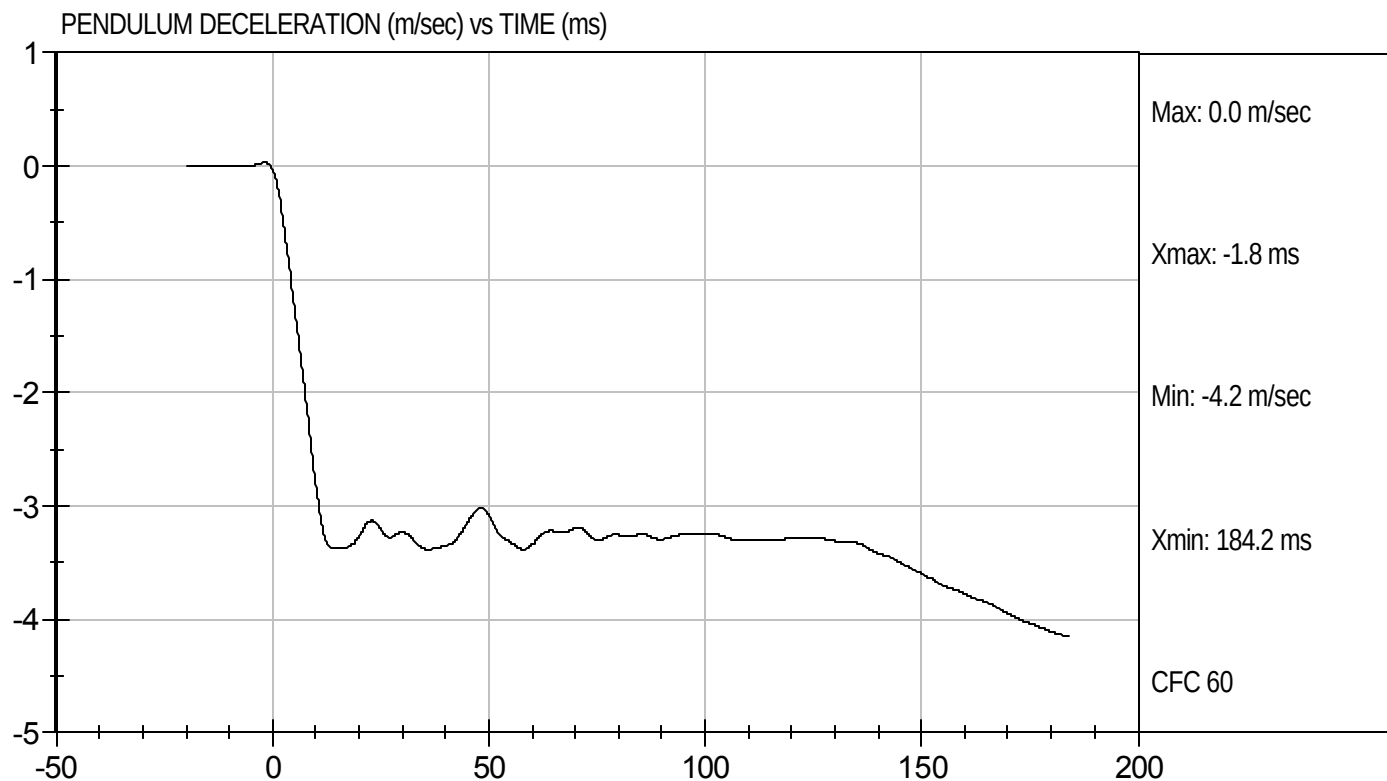
4/30/09  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D09992

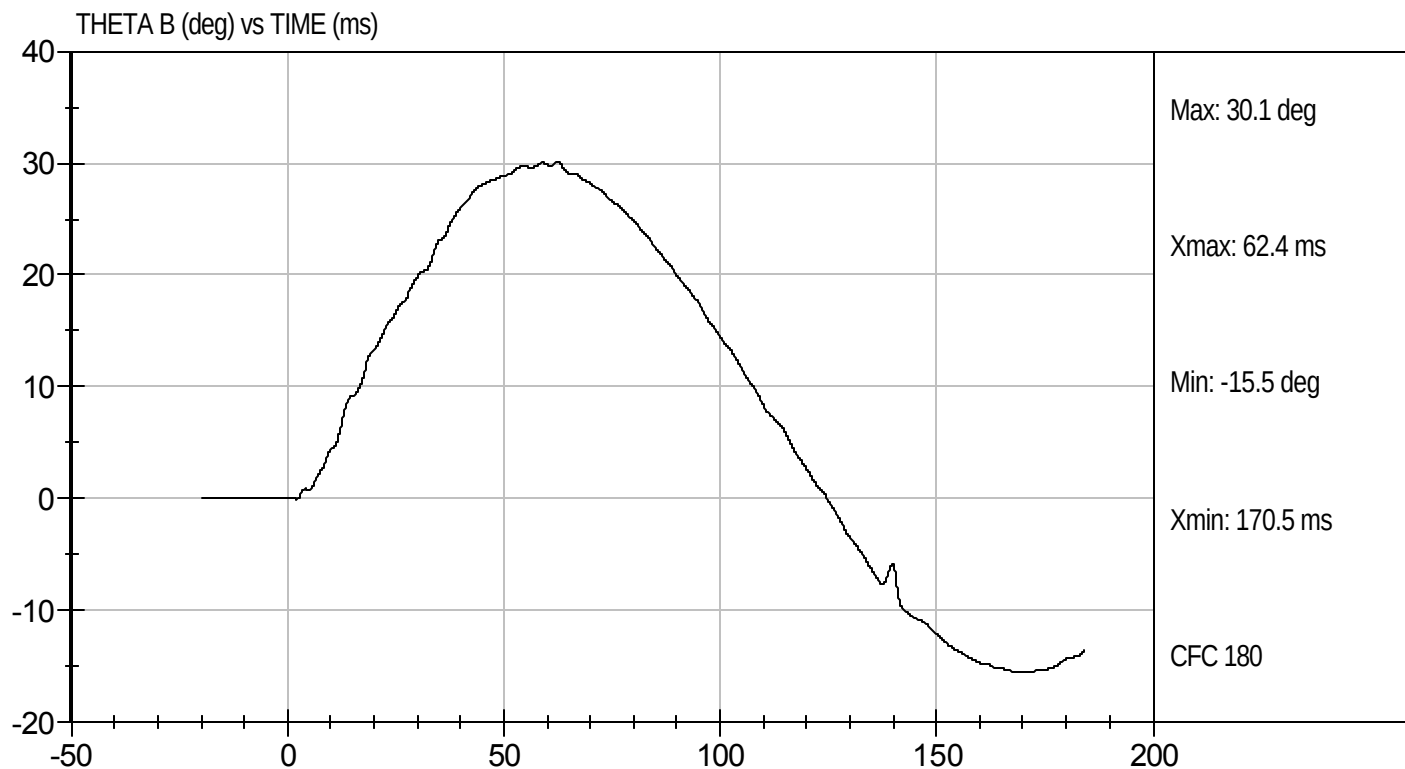
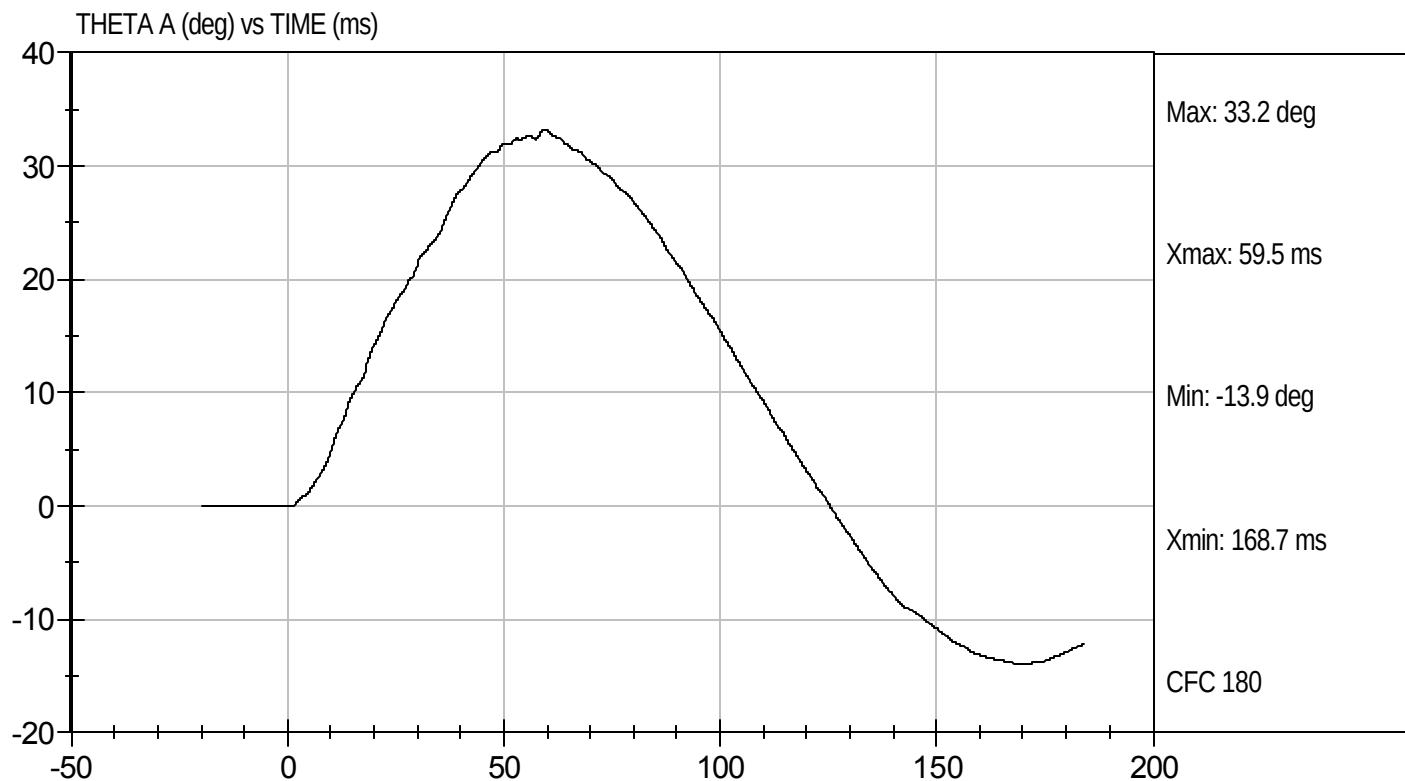
Test Date: 4/30/09  
Velocity: 11.41 ft/s, 3.5 m/s





Test Desc: Neck Bending  
Component ID: D09992

Test Date: 4/30/09  
Velocity: 11.41 ft/s, 3.5 m/s



**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09993

| Tested Parameter                   | Units | Specification | Result | Pass/Fail |
|------------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature             | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Laboratory Relative Humidity       | %     | 10 to 70      | 48     | Pass      |
| Pendulum Speed                     | m/s   | 4.2 to 4.4    | 4.3    | Pass      |
| Peak Shoulder Acceleration         | G's   | 7.5 to 10.5   | 9.6    | Pass      |
| Time of Peak Shoulder Acceleration | msec  | NA            | 17.2   | Pass      |
| Overall Test Results               |       |               | Pass   |           |

  
Laboratory Technician

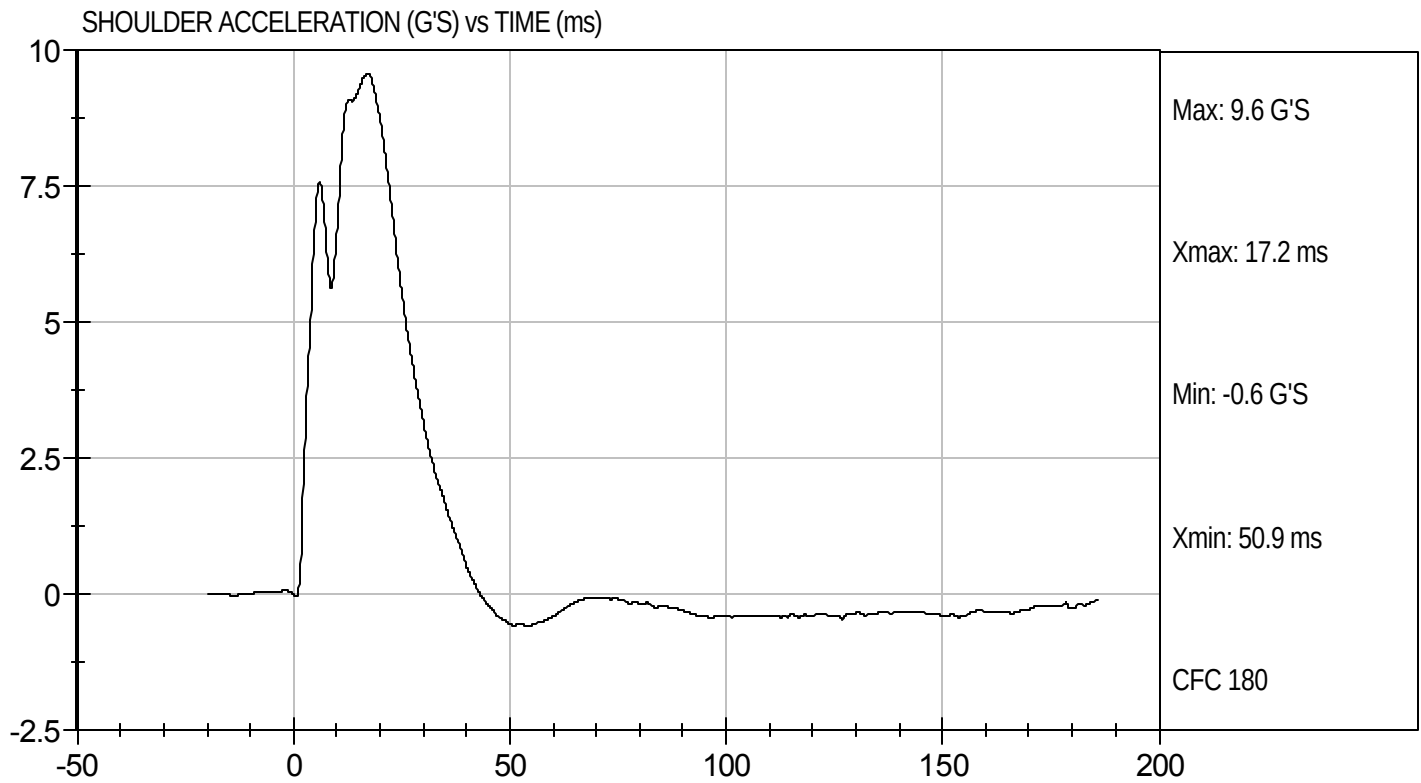
4/30/09  
Test Date

  
Approved By



Test Desc: Shoulder Impact  
Component ID: D09993

Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.3 m/s



MGA RESEARCH CORPORATION

UPPER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D09994

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.2   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 50     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 37.1   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 47.5   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

4/30/09  
Test Date

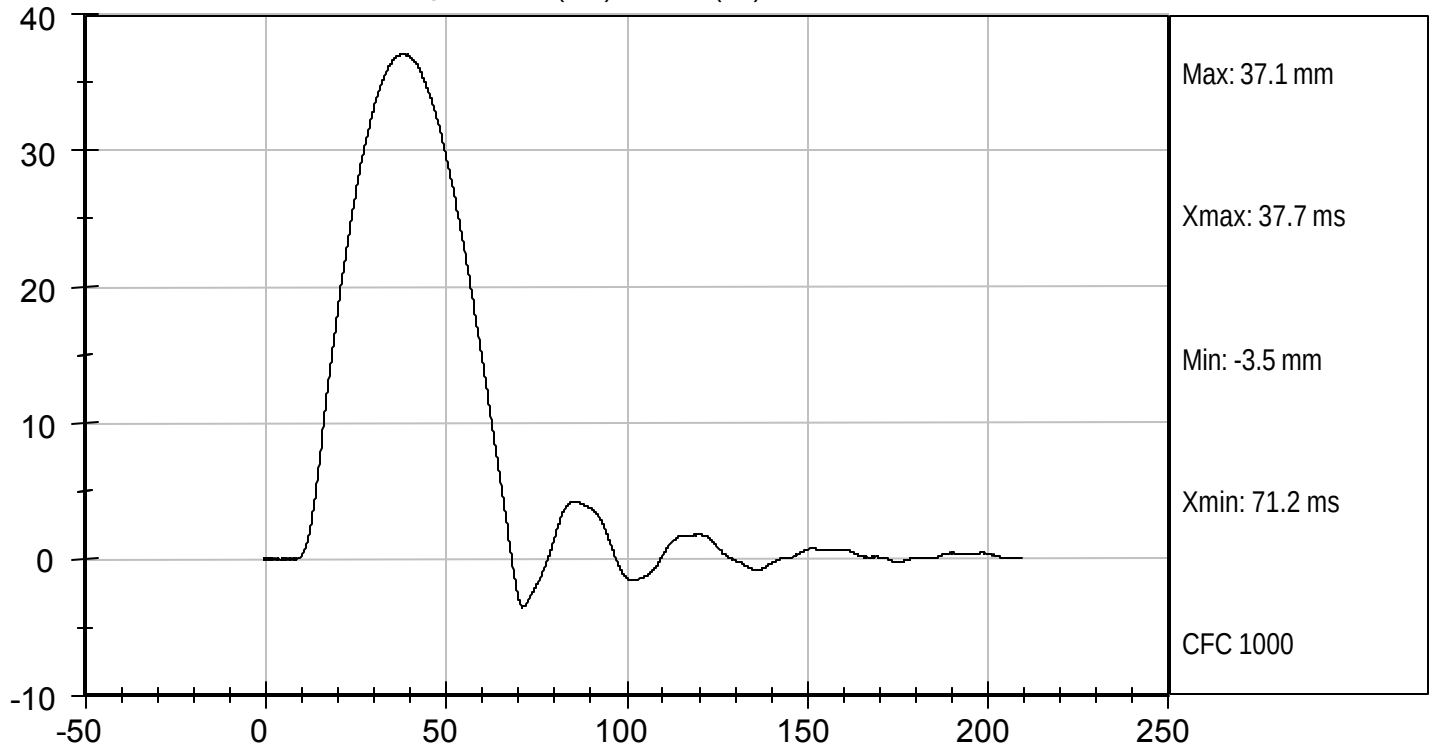
David Winkelbauer  
Approved By



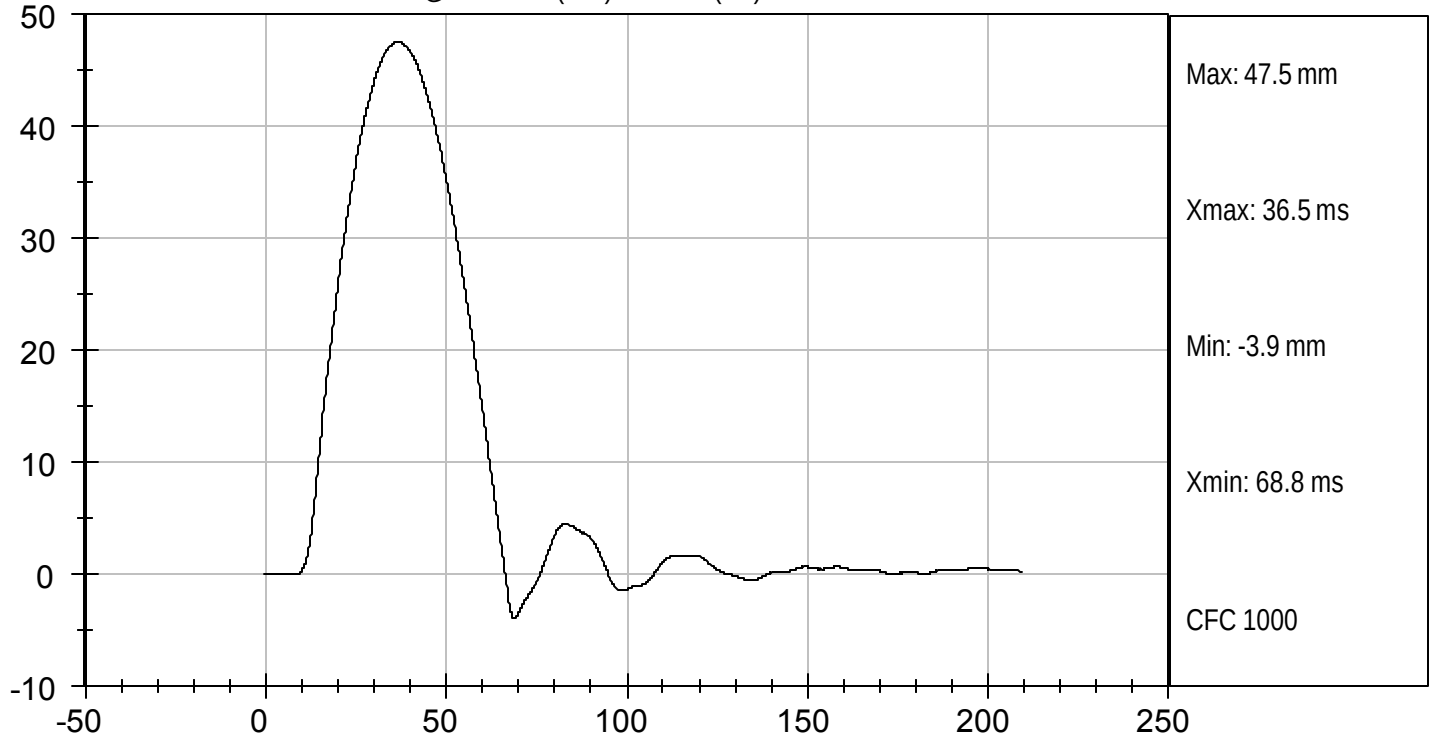
Test Desc: Rib Impact - Upper  
Component ID: D09994

Test Date: 4/30/09

UPPER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



UPPER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)



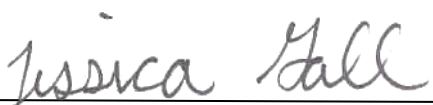
MGA RESEARCH CORPORATION

MID RIB TEST  
ES-2re DUMMY

ATD Serial No: 032

Test I.D: D09995

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 50     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 37.5   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 48.2   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

  
Laboratory Technician

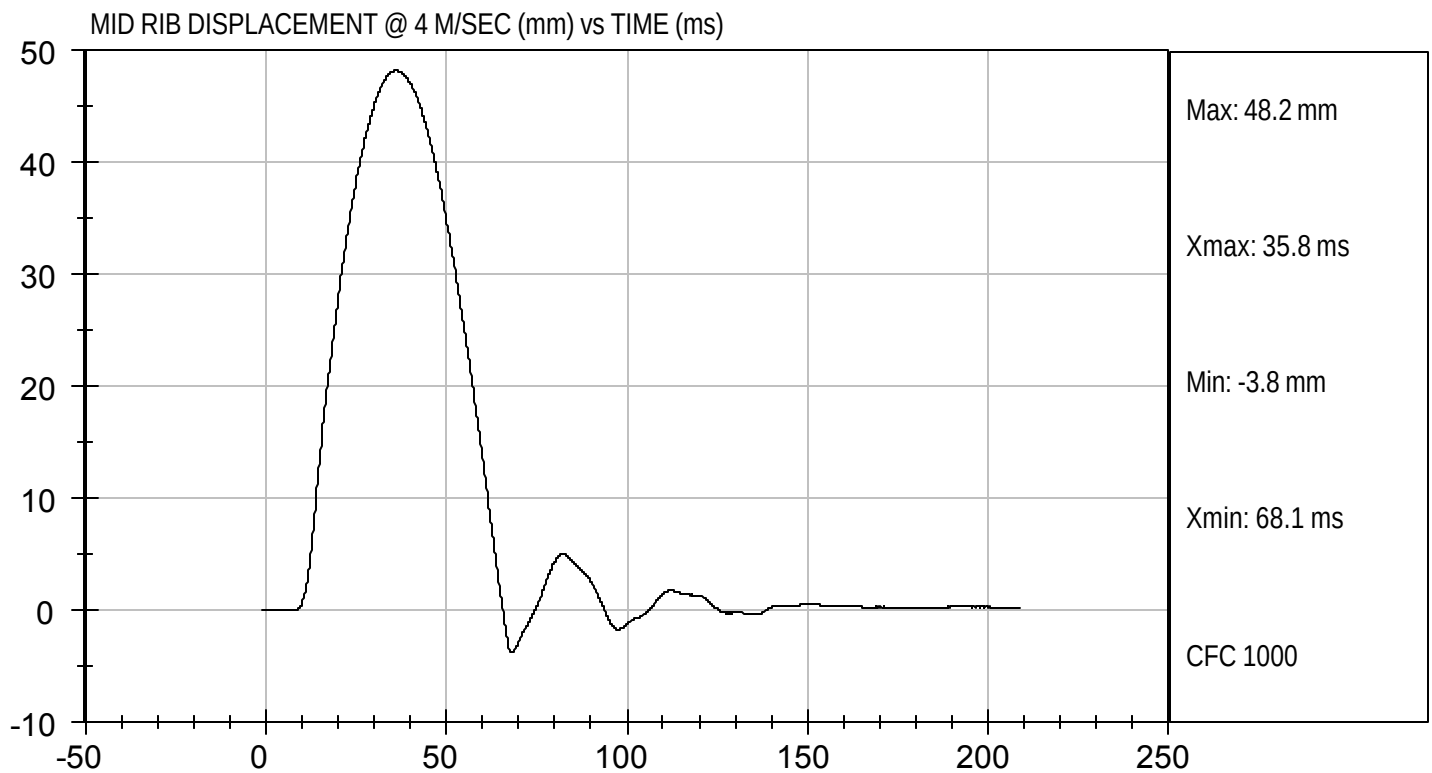
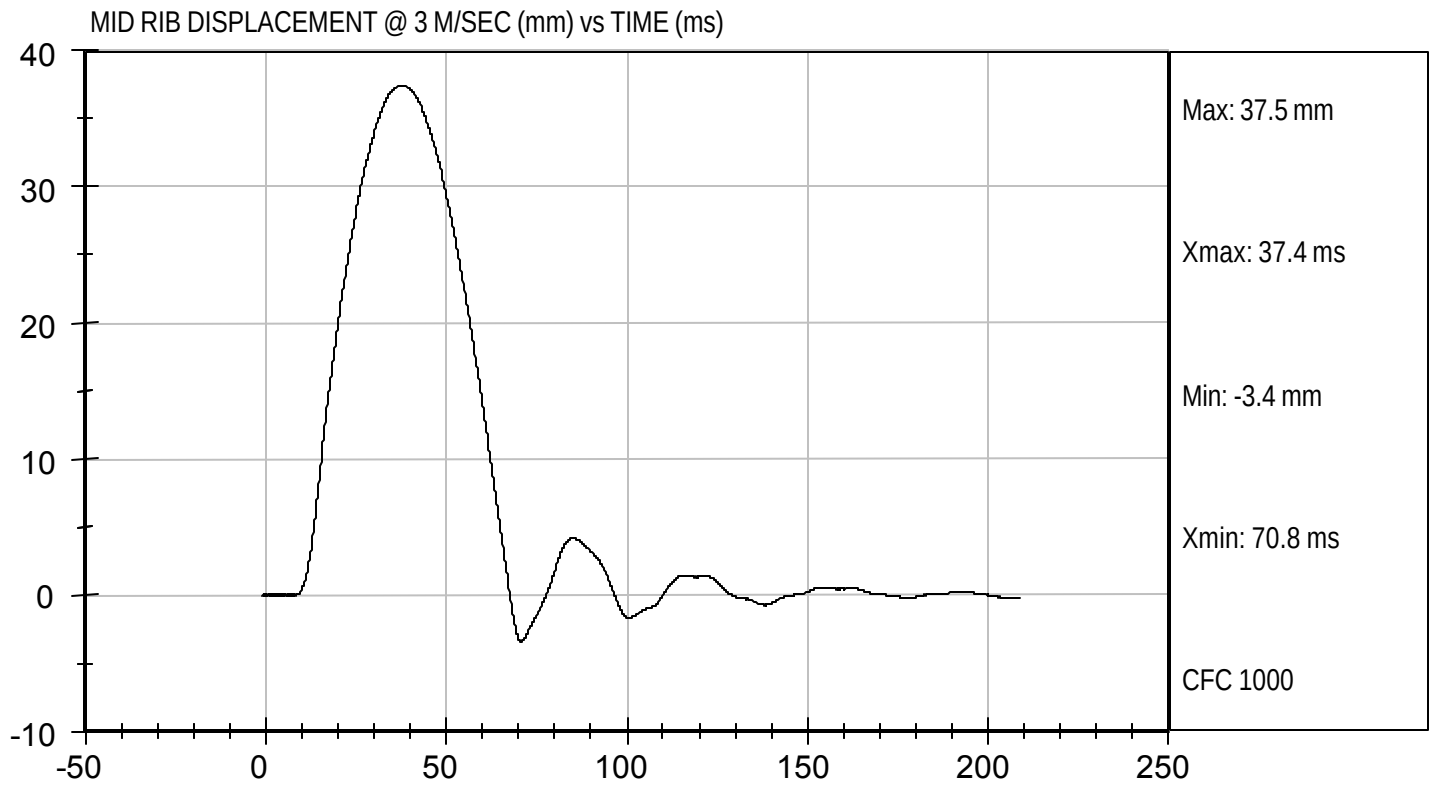
4/30/09  
Test Date

  
Approved By



Test Desc: Rib Impact - Mid  
Component ID: D09995

Test Date: 4/30/09



MGA RESEARCH CORPORATION

LOWER RIB TEST

ES-2re DUMMY

ATD Serial No: 032

Test I.D: D09996

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 50     | Pass      |
| Displacement at 3 m/s        | mm    | 36.0 to 40.0  | 36.7   | Pass      |
| Displacement at 4 m/s        | mm    | 46.0 to 51.0  | 47.9   | Pass      |
| Overall Test Results         |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

4/30/09  
Test Date

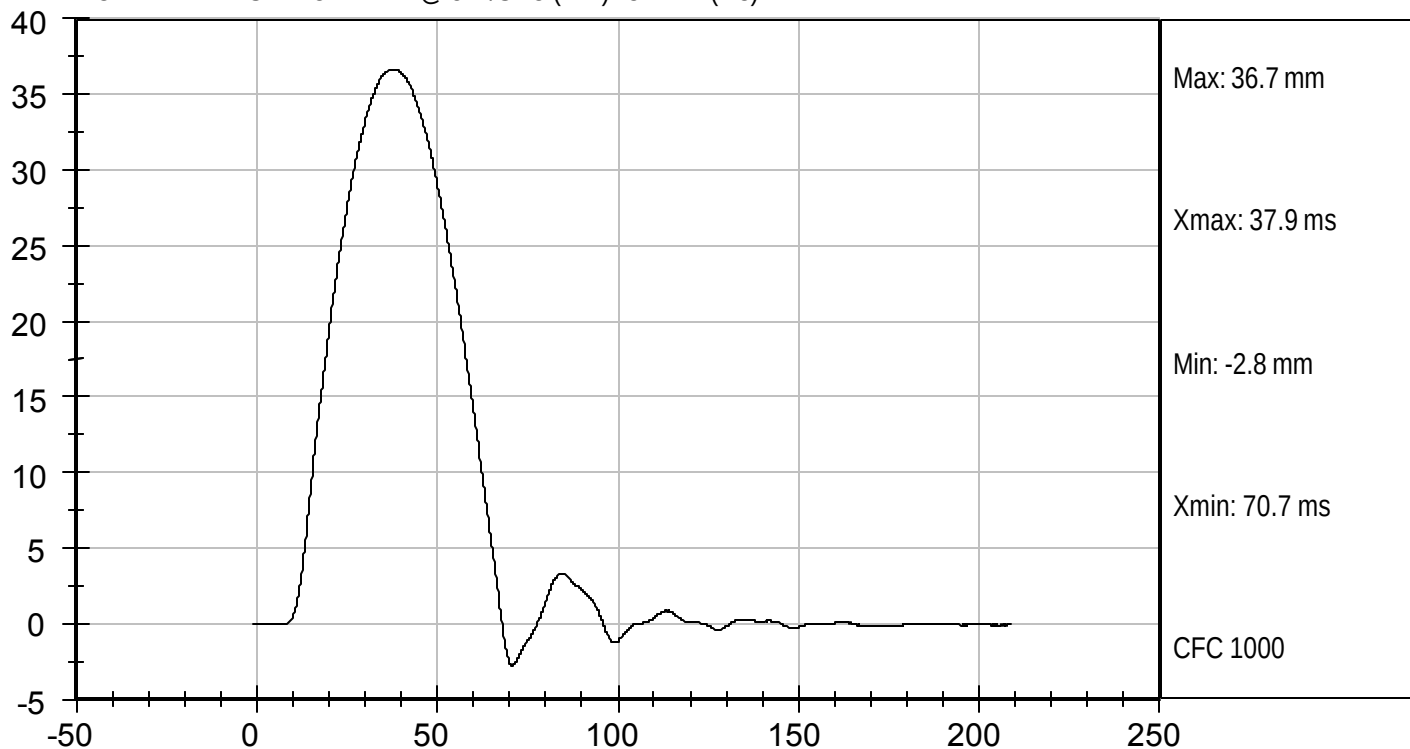
David Winkelbauer  
Approved By



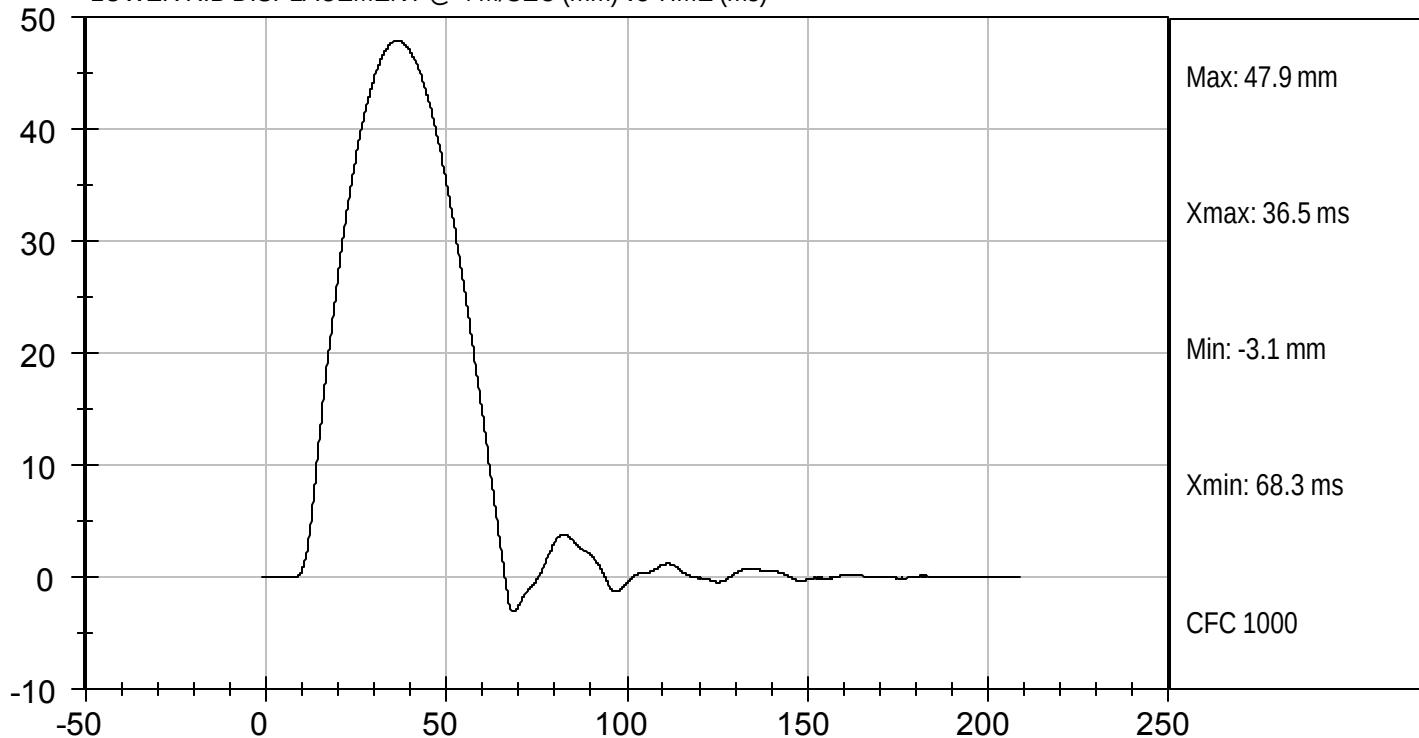
Test Desc: Rib Impact - Lower  
Component ID: D09996

Test Date: 4/30/09

LOWER RIB DISPLACEMENT @ 3 M/SEC (mm) vs TIME (ms)



LOWER RIB DISPLACEMENT @ 4 M/SEC (mm) vs TIME (ms)

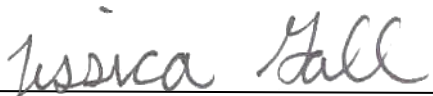


**MGA RESEARCH CORPORATION**  
**ABDOMEN TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09997

| Tested Parameter               | Units | Specification  | Result | Pass/Fail |
|--------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2   | 21.4   | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70       | 48     | Pass      |
| Probe Speed                    | m/s   | 3.90 to 4.10   | 3.99   | Pass      |
| Maximum Impact Force           | kN    | 4.00 to 4.80   | 4.07   | Pass      |
| Time of Maximum Impactor Force | msec  | 10.60 to 13.00 | 11.50  | Pass      |
| Maximum Total Abdomen Force    | kN    | 2.20 to 2.70   | 2.44   | Pass      |
| Time of Maximum Abdomen Force  | msec  | 10.00 to 12.30 | 11.10  | Pass      |
| Overall Test Results           |       |                |        | Pass      |

  
Laboratory Technician

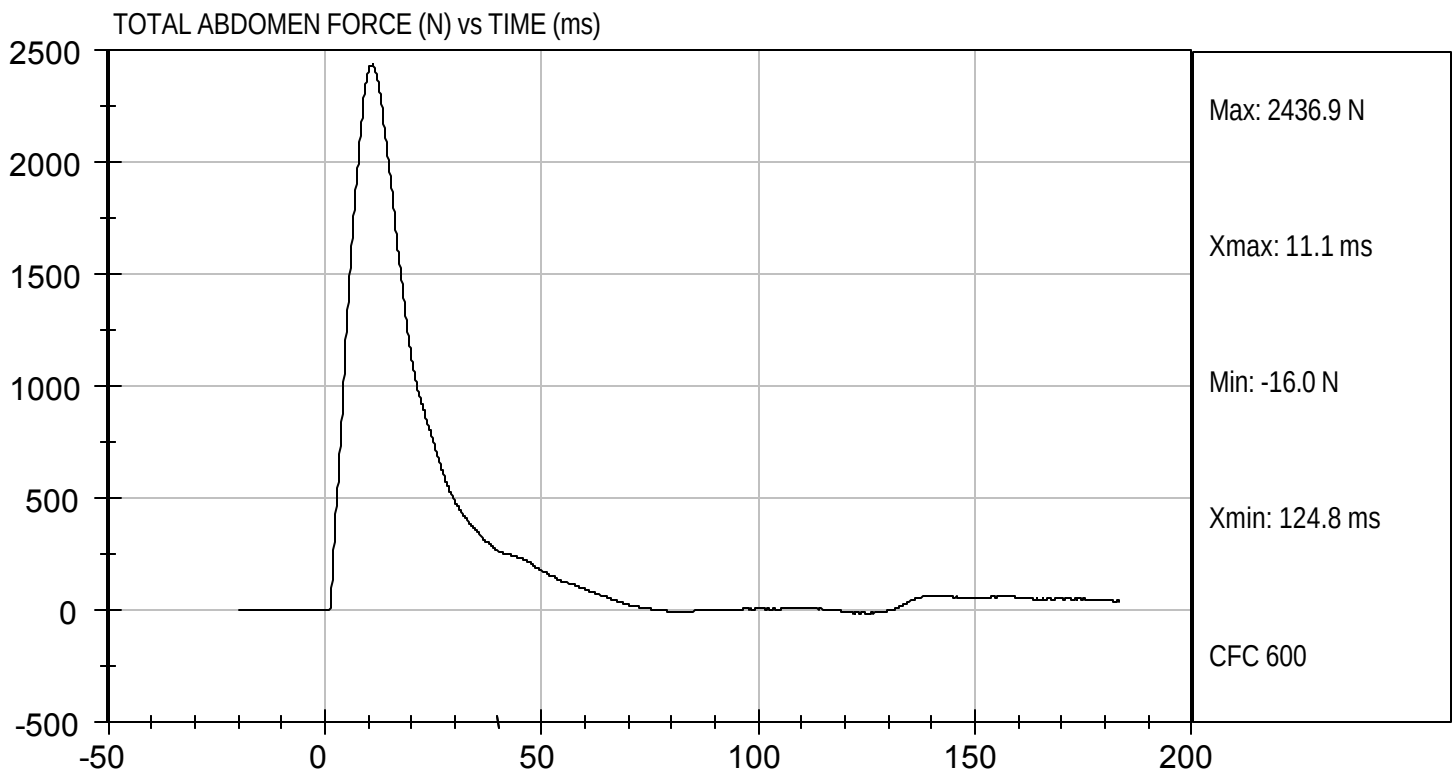
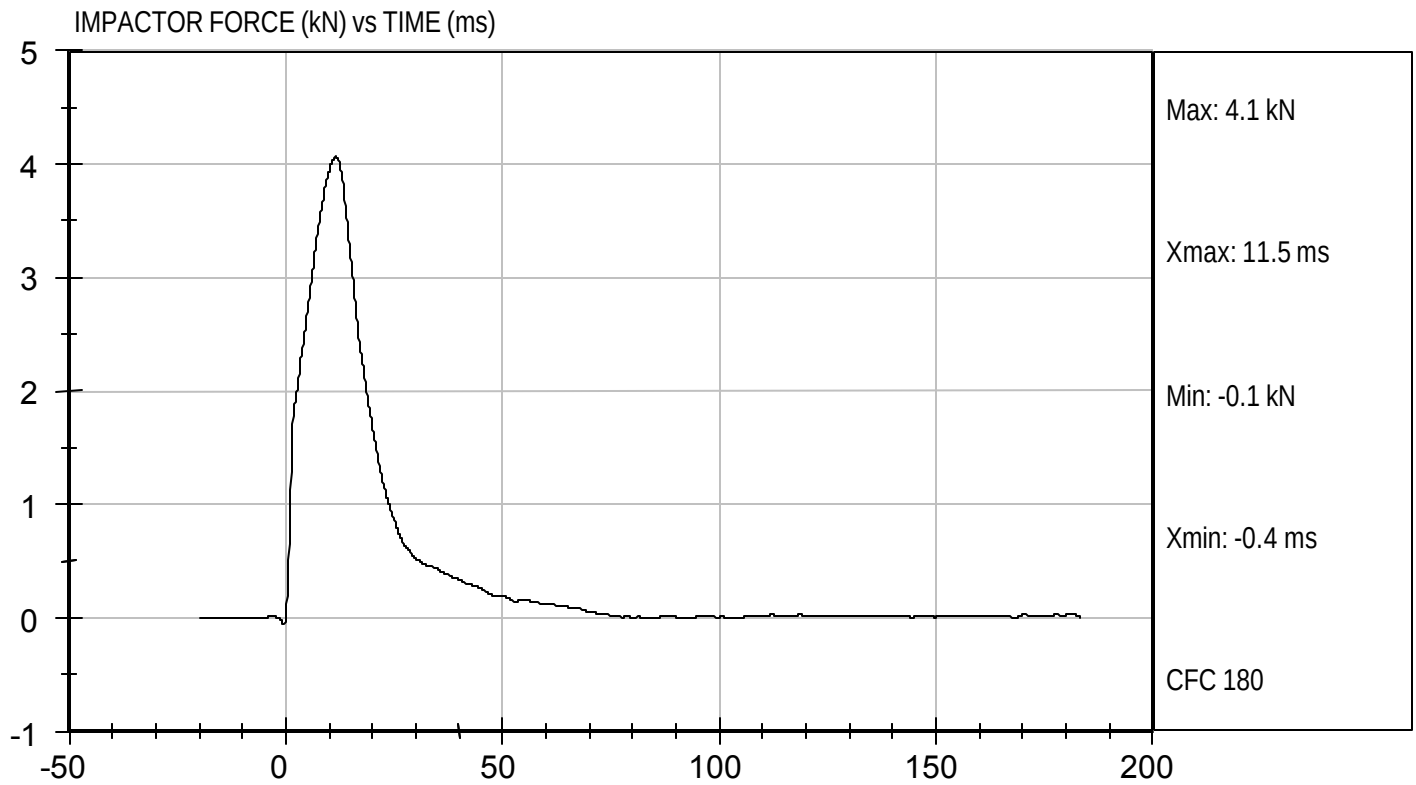
4/30/09  
Test Date

  
Approved By



Test Desc: Abdomen Impact  
Component ID: D09997

Test Date: 4/30/09  
Velocity: 13.12 ft/s, 3.99 m/s

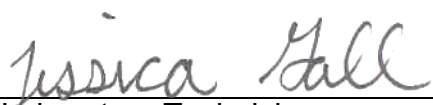


**MGA RESEARCH CORPORATION**  
**LUMBAR SPINE TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09998

| Tested Parameter                            |          | Units | Specification   | Result | Pass/Fail |
|---------------------------------------------|----------|-------|-----------------|--------|-----------|
| Laboratory Temperature                      |          | deg C | 20.6 to 22.2    | 21.5   | Pass      |
| Laboratory Relative Humidity                |          | %     | 10 to 70        | 50     | Pass      |
| Pendulum Speed                              |          | m/sec | 5.95 to 6.15    | 6.12   | Pass      |
| Pendulum Deceleration                       | 1 msec   | m/sec | -0.05 to 0.00   | -0.01  | Pass      |
|                                             | 3.7 msec | m/sec | -0.425 to -0.24 | -0.42  | Pass      |
|                                             | 27 msec  | m/sec | -6.50 to -5.80  | -6.05  | Pass      |
|                                             | 30 msec  | m/sec | >= -6.5         | -5.97  | Pass      |
| Maximum Flexion Angle                       |          | deg   | 45.0 to 55.0    | 51.0   | Pass      |
| Time of Maximum Flexion Angle               |          | msec  | 39.0 to 53.0    | 45.6   | Pass      |
| Headform Rotation Decay to Initial Position |          | msec  | 37 to 57        | 46     | Pass      |
| Overall Results                             |          |       |                 | Pass   |           |

  
 Laboratory Technician

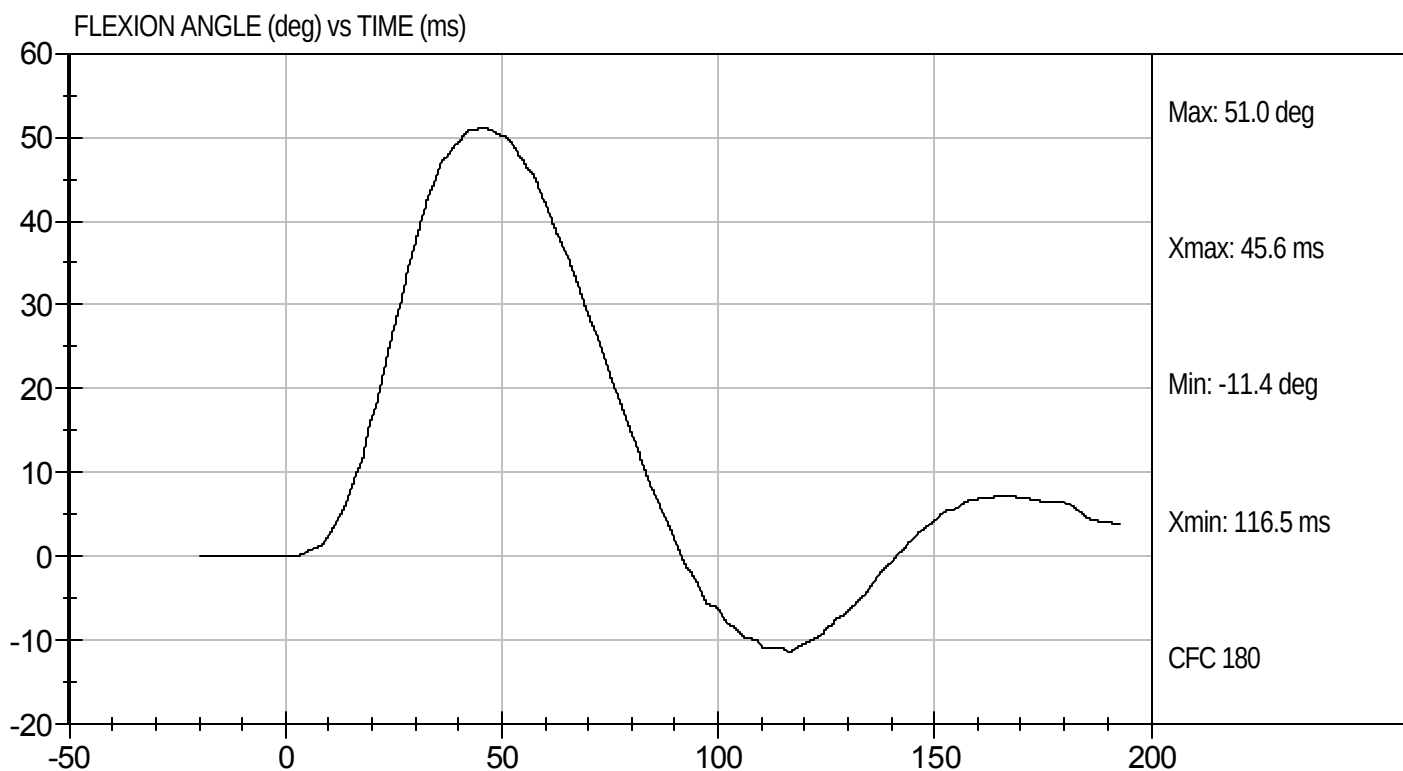
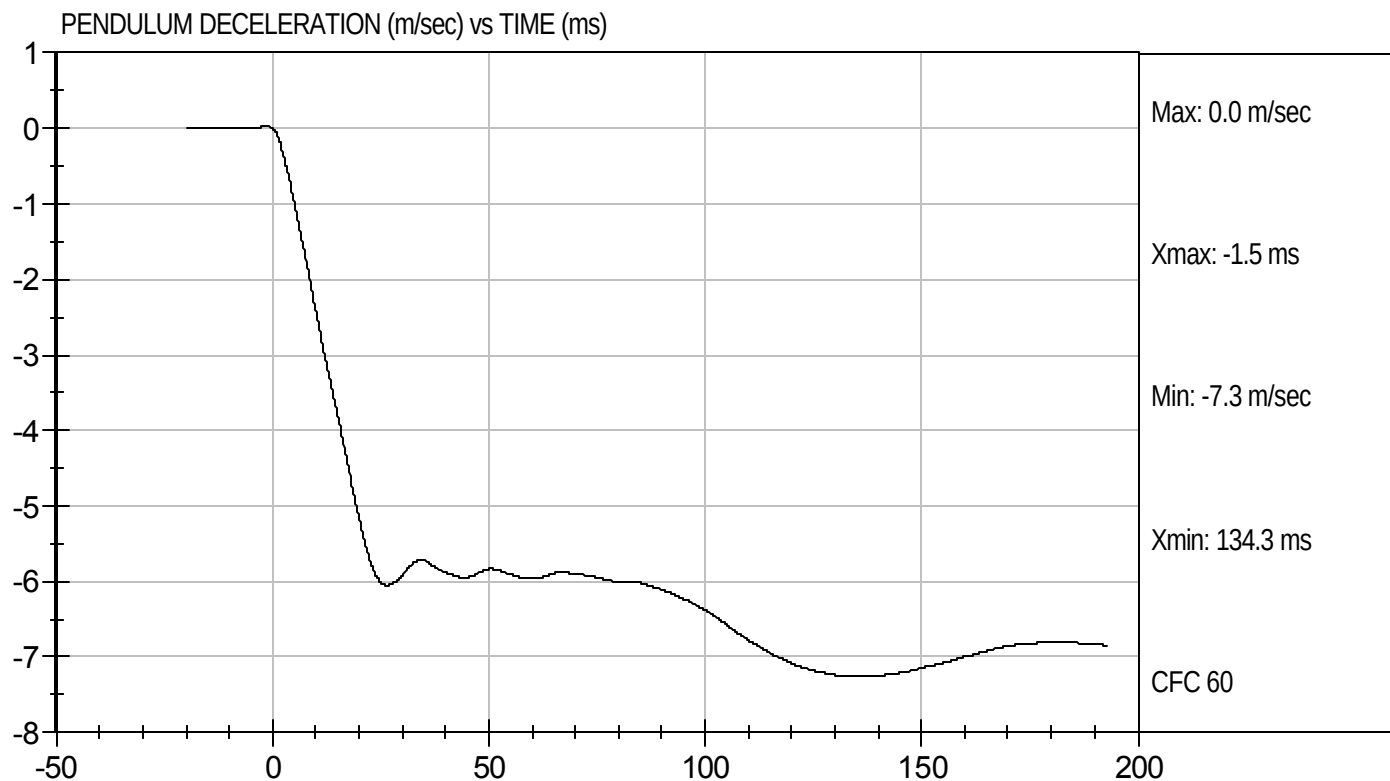
4/30/09  
 Test Date

  
 Approved By



Test Desc: Lumbar Bending  
Component ID: D09998

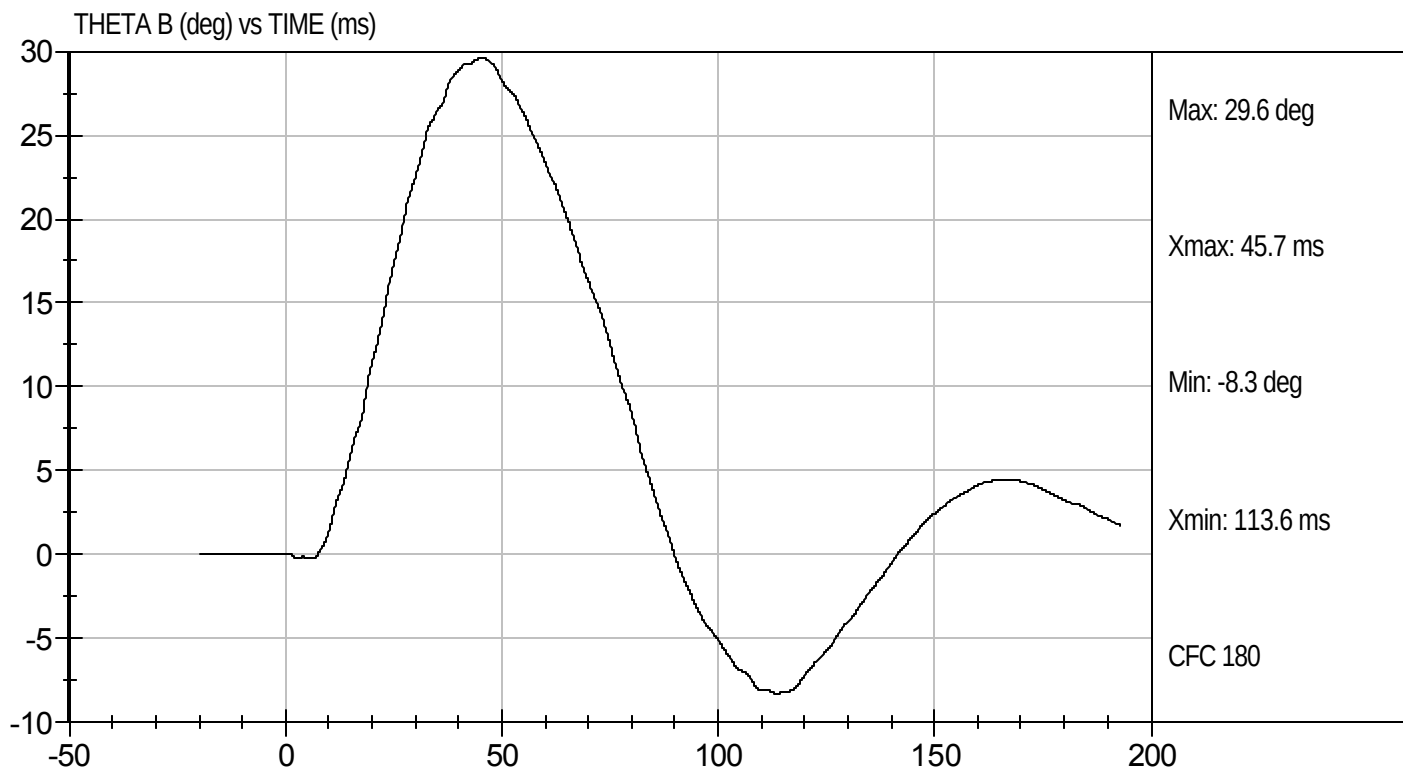
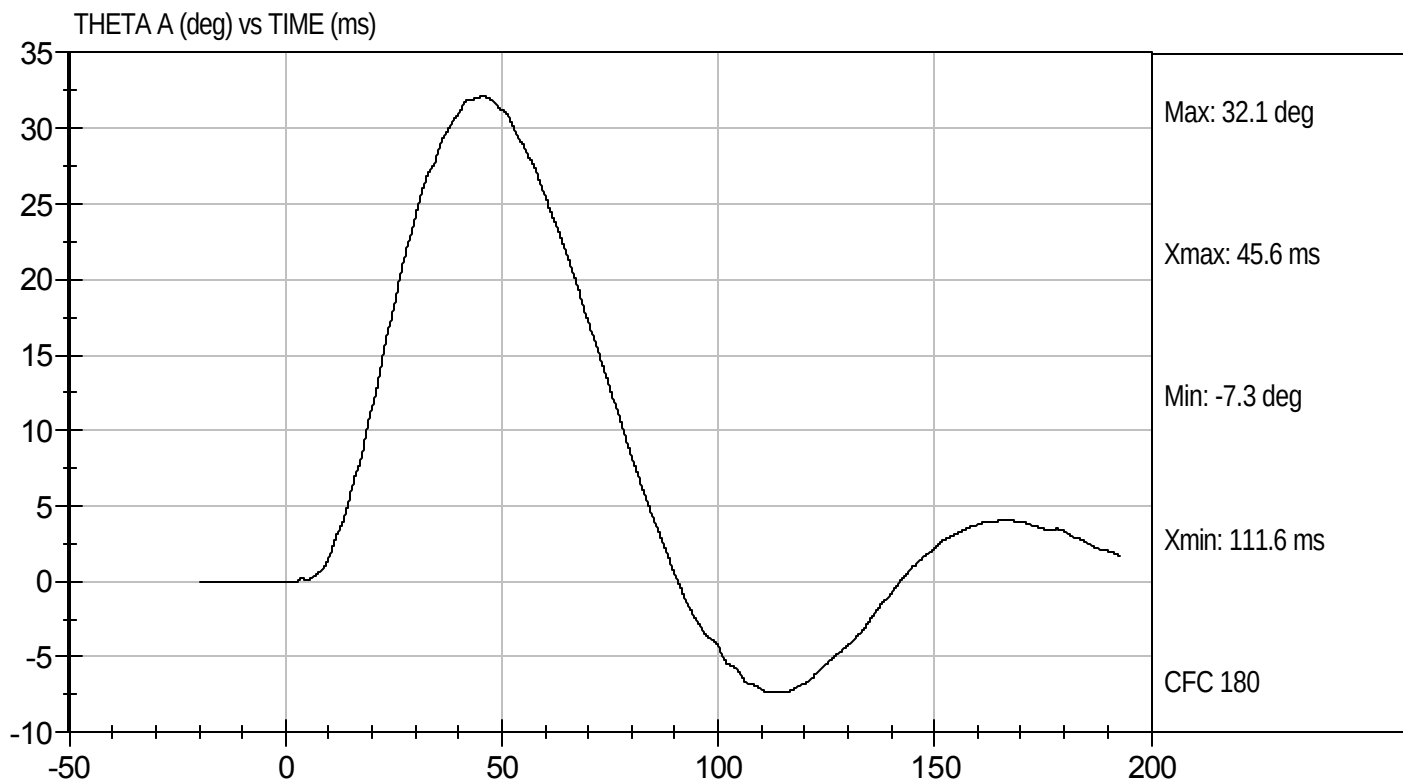
Test Date: 4/30/09  
Velocity: 20.08 ft/s, 6.12 m/s





Test Desc: Lumbar Bending  
Component ID: D09998

Test Date: 4/30/09  
Velocity: 20.08 ft/s, 6.12 m/s



## MGA RESEARCH CORPORATION

PELVIS TEST  
ES-2re DUMMYATD Serial No: 032Test I.D: D09999

| Tested Parameter               | Units | Specification  | Result | Pass/Fail |
|--------------------------------|-------|----------------|--------|-----------|
| Laboratory Temperature         | deg C | 20.6 to 22.2   | 21.5   | Pass      |
| Laboratory Relative Humidity   | %     | 10 to 70       | 47     | Pass      |
| Probe Speed                    | m/s   | 4.20 to 4.40   | 4.30   | Pass      |
| Maximum Impactor Force         | kN    | 4.70 to 5.40   | 4.76   | Pass      |
| Time of Maximum Impactor Force | msec  | 11.80 to 16.10 | 13.70  | Pass      |
| Maximum Pubic Force            | kN    | 1.23 to 1.59   | 1.40   | Pass      |
| Time of Maximum Pubic Force    | msec  | 12.20 to 17.00 | 14.30  | Pass      |
| Overall Test Results           |       |                |        | Pass      |

  
Laboratory Technician

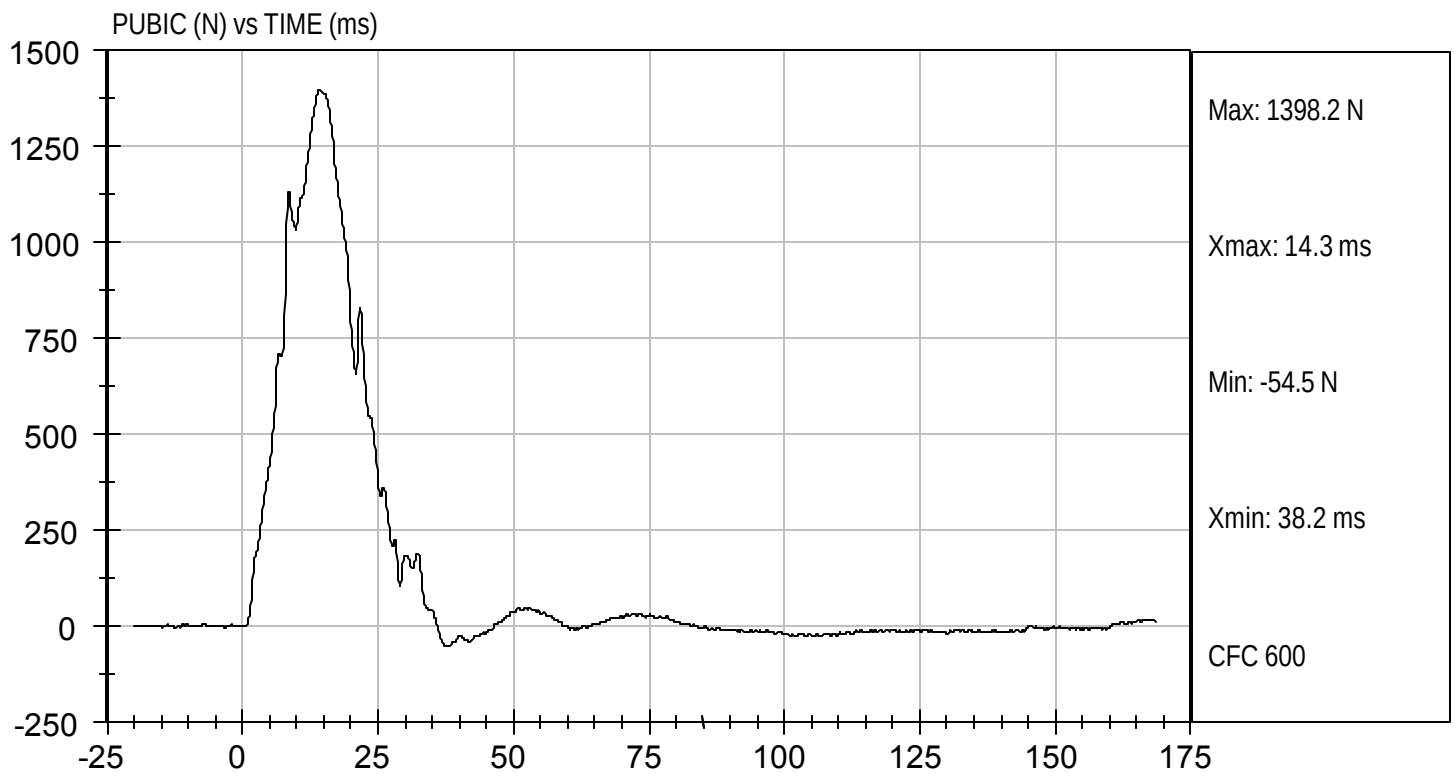
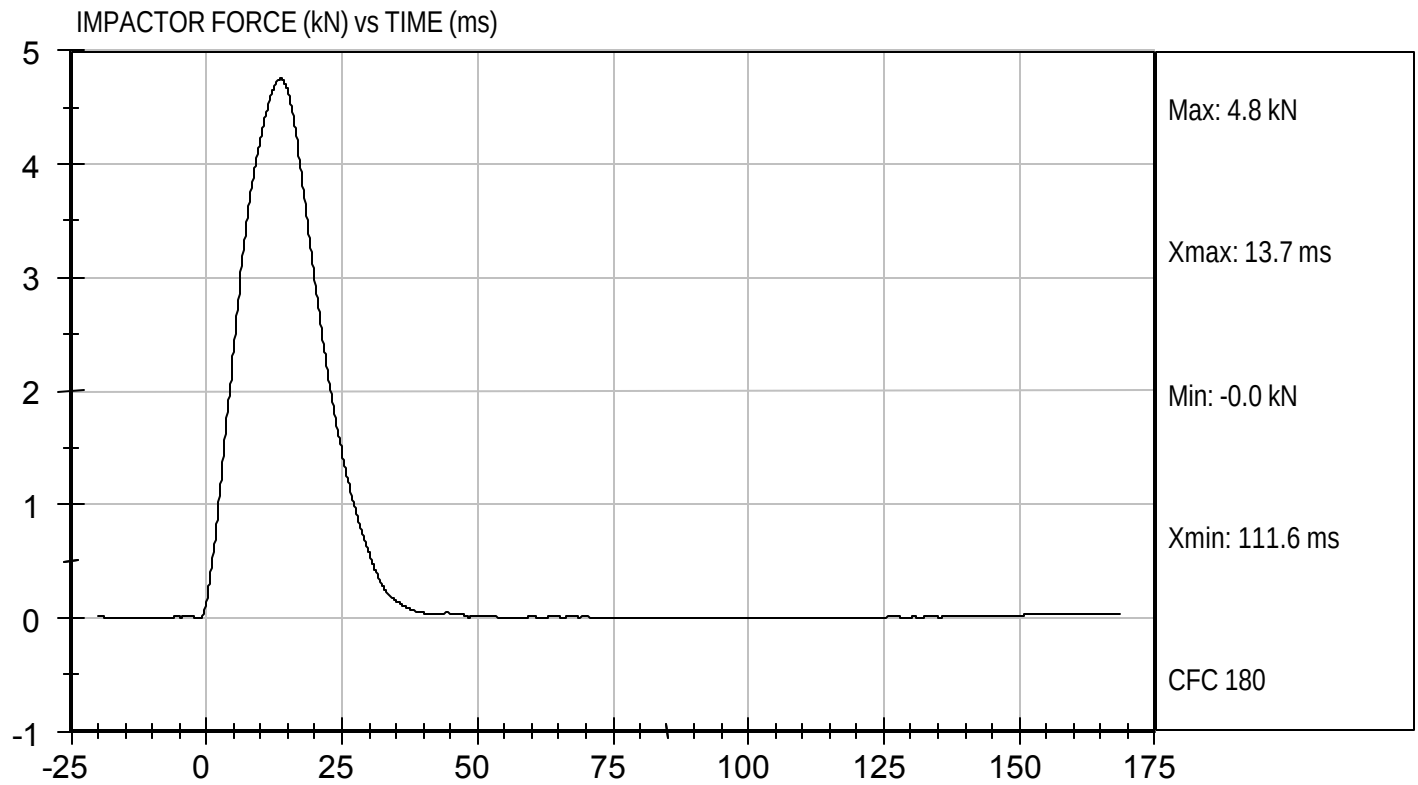
4/30/09  
Test Date

  
Approved By



Test Desc: Pelvis Impact  
Component ID: D09999

Test Date: 4/30/09  
Velocity: 14.1 ft/s, 4.30 m/s

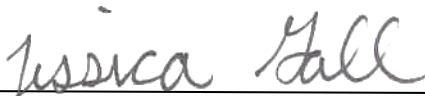


**MGA RESEARCH CORPORATION**  
**FULL BODY THORAX IMPACT TEST**  
**ES-2re DUMMY**

**ATD Serial No:** 032

**Test I.D:** D09990

| Tested Parameter                    | Units | Specification | Result               | Pass/Fail |
|-------------------------------------|-------|---------------|----------------------|-----------|
| Temperature                         | deg C | 20.6 to 22.2  | 21.5                 | Pass      |
| Humidity                            | %     | 10 to 70      | 48                   | Pass      |
| Probe Speed                         | m/s   | 5.40 to 5.60  | 5.58                 | Pass      |
| Maximum Impactor Force (after 6 ms) | kN    | 5.17 to 6.12  | 5.37                 | Pass      |
| Upper Rib Displacement              | mm    | 33.2 to 41.3  | 37.0                 | Pass      |
| Middle Rib Displacement             | mm    | 37.1 to 45.4  | 40.3                 | Pass      |
| Lower Rib Displacement              | mm    | 35.6 to 43.0  | 40.0                 | Pass      |
|                                     |       |               | Overall Test Results | Pass      |

  
Laboratory Technician

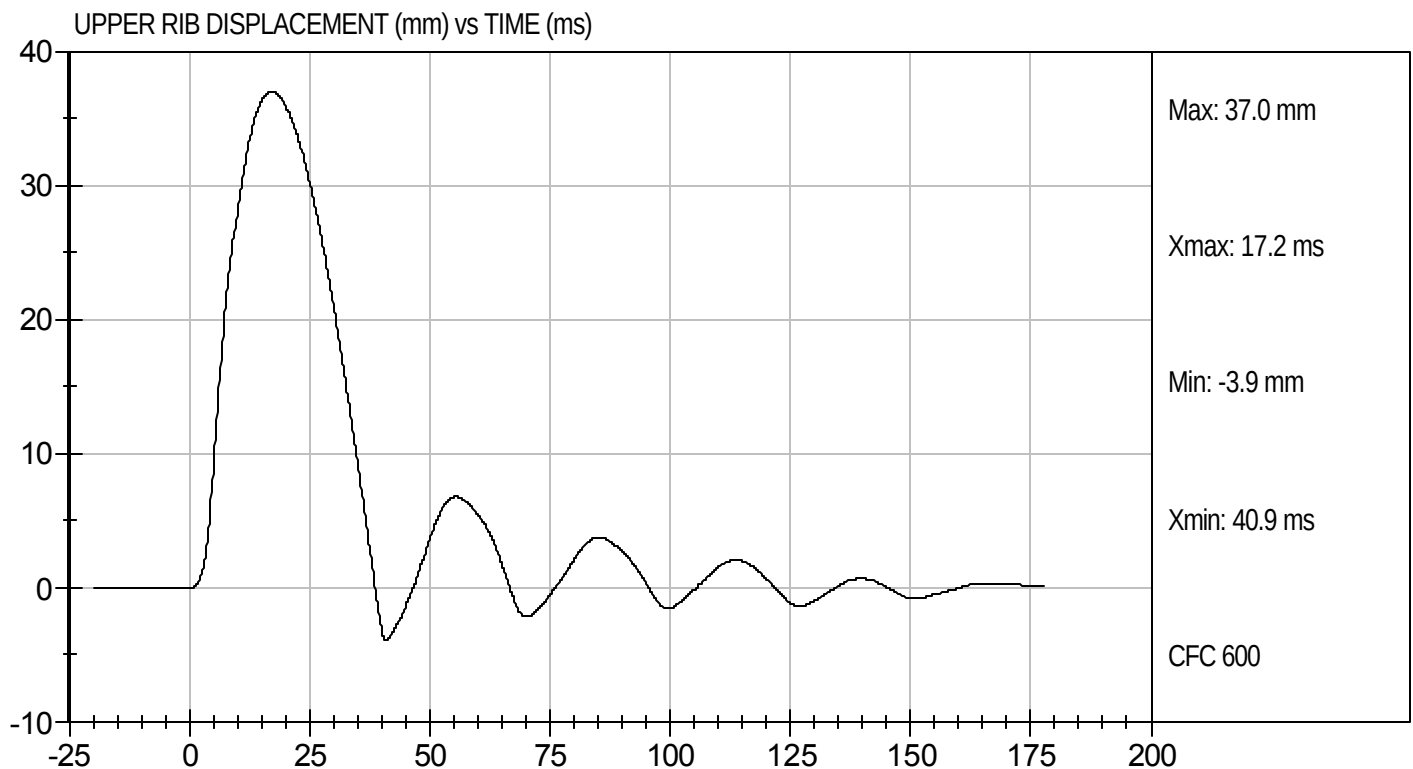
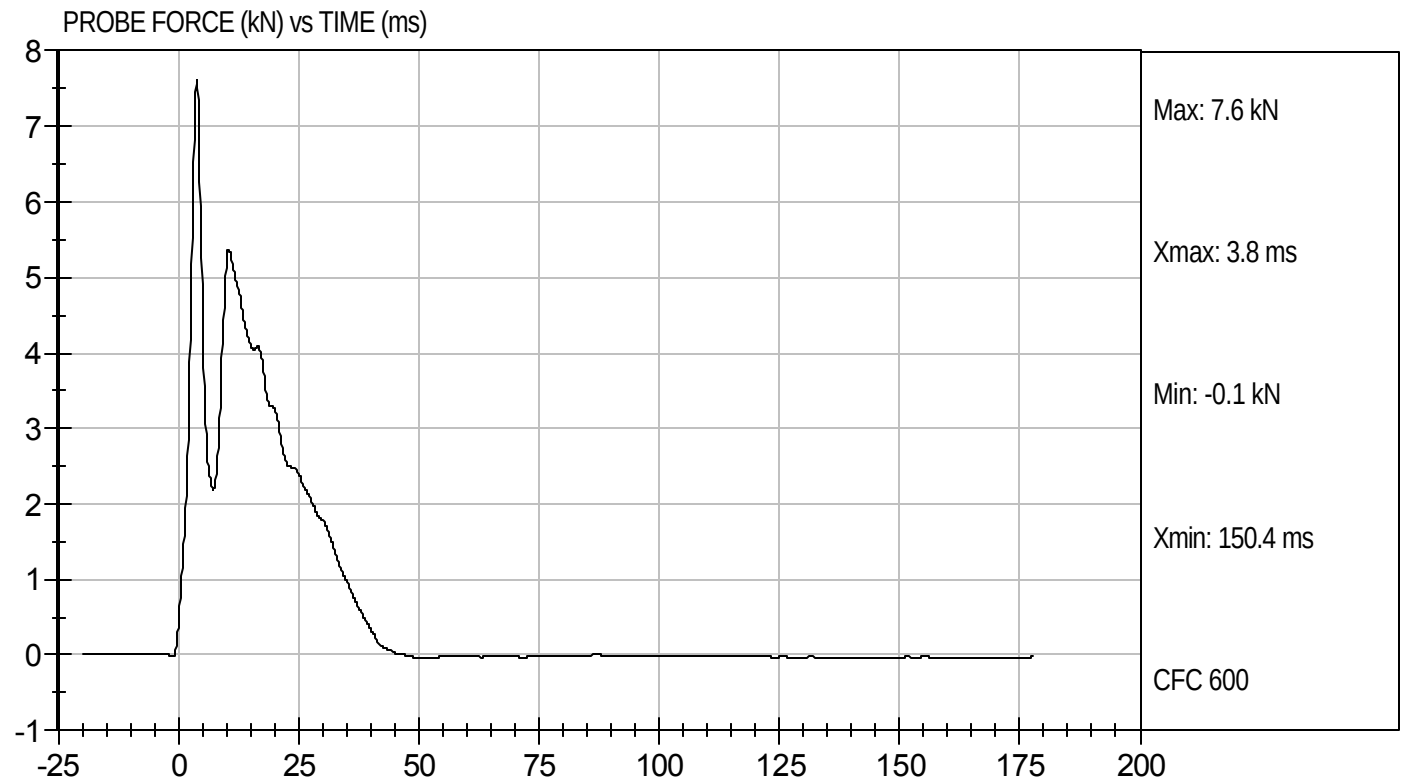
4/30/09  
Test Date

  
Approved By



Test Desc: Thorax Impact  
Component ID: D09990

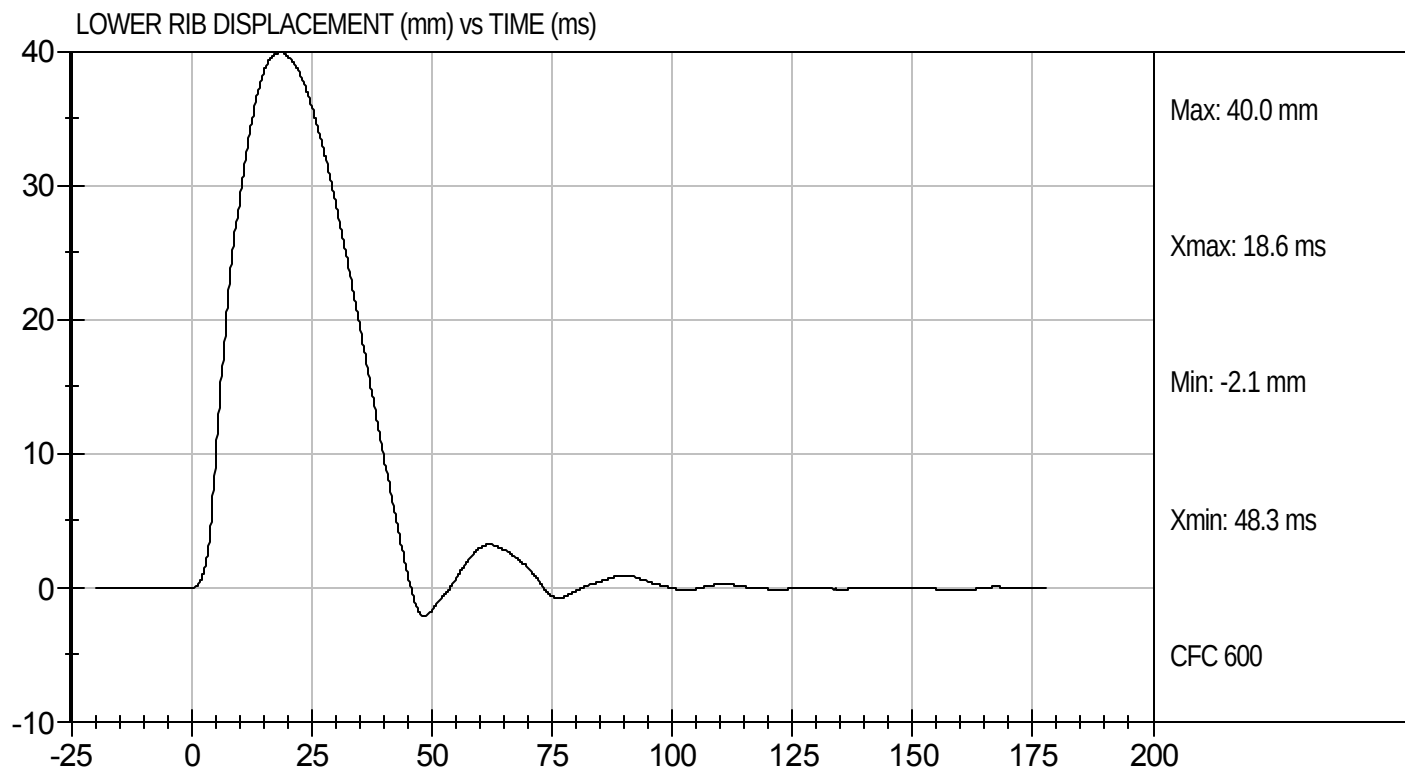
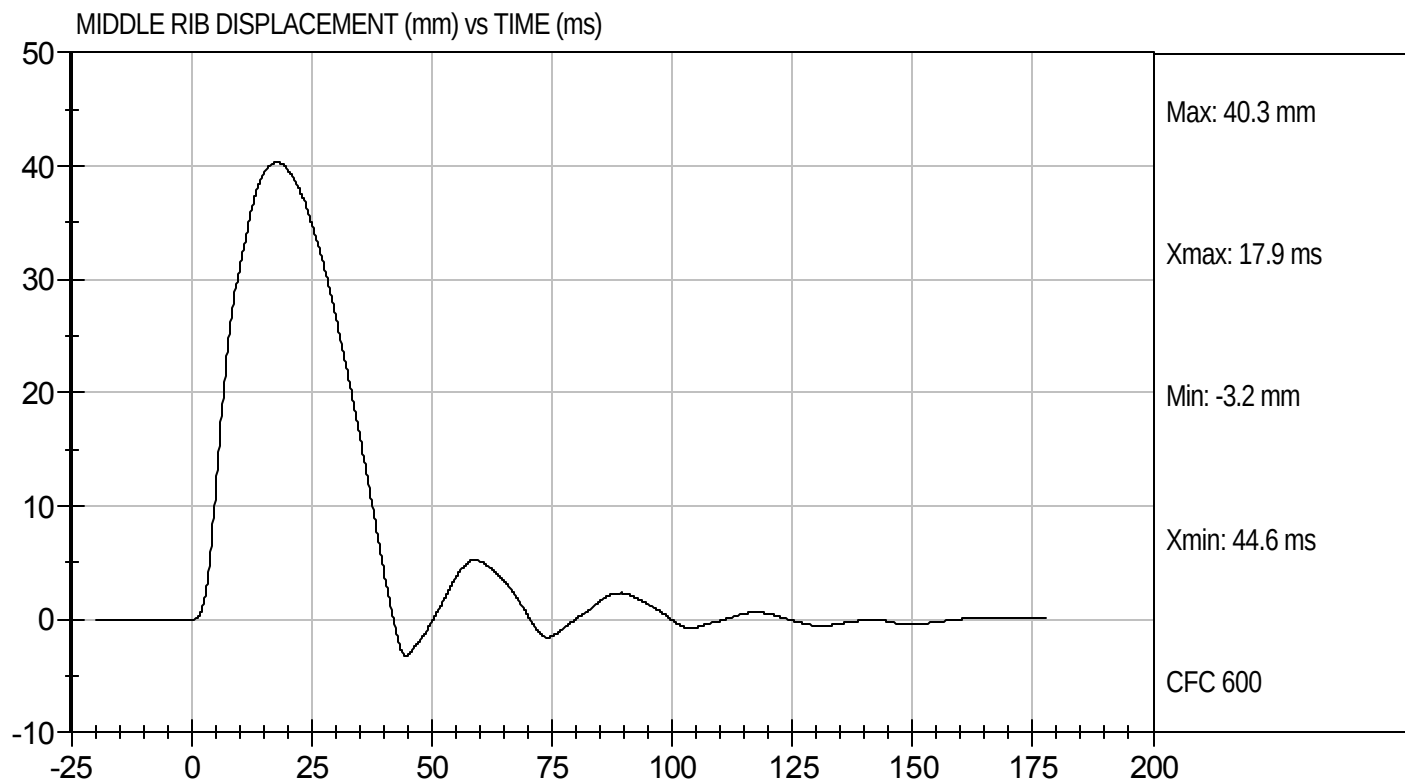
Test Date: 4/30/09  
Velocity: 18.31 ft/s, 5.58 m/s





Test Desc: Thorax Impact  
Component ID: D09990

Test Date: 4/30/09  
Velocity: 18.31 ft/s, 5.58 m/s

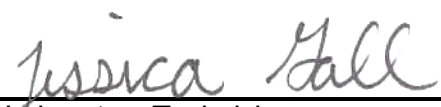


**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D09891

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.6   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 49     | Pass      |
| Peak Resultant Acceleration  | G's   | 115 to 137    | 123    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15        | 5.3    | Pass      |
| Unimodal                     | N/A   | <15%          | Yes    | Pass      |
| Overall Test Results         |       |               | Pass   |           |

  
Laboratory Technician

4/24/09  
Test Date

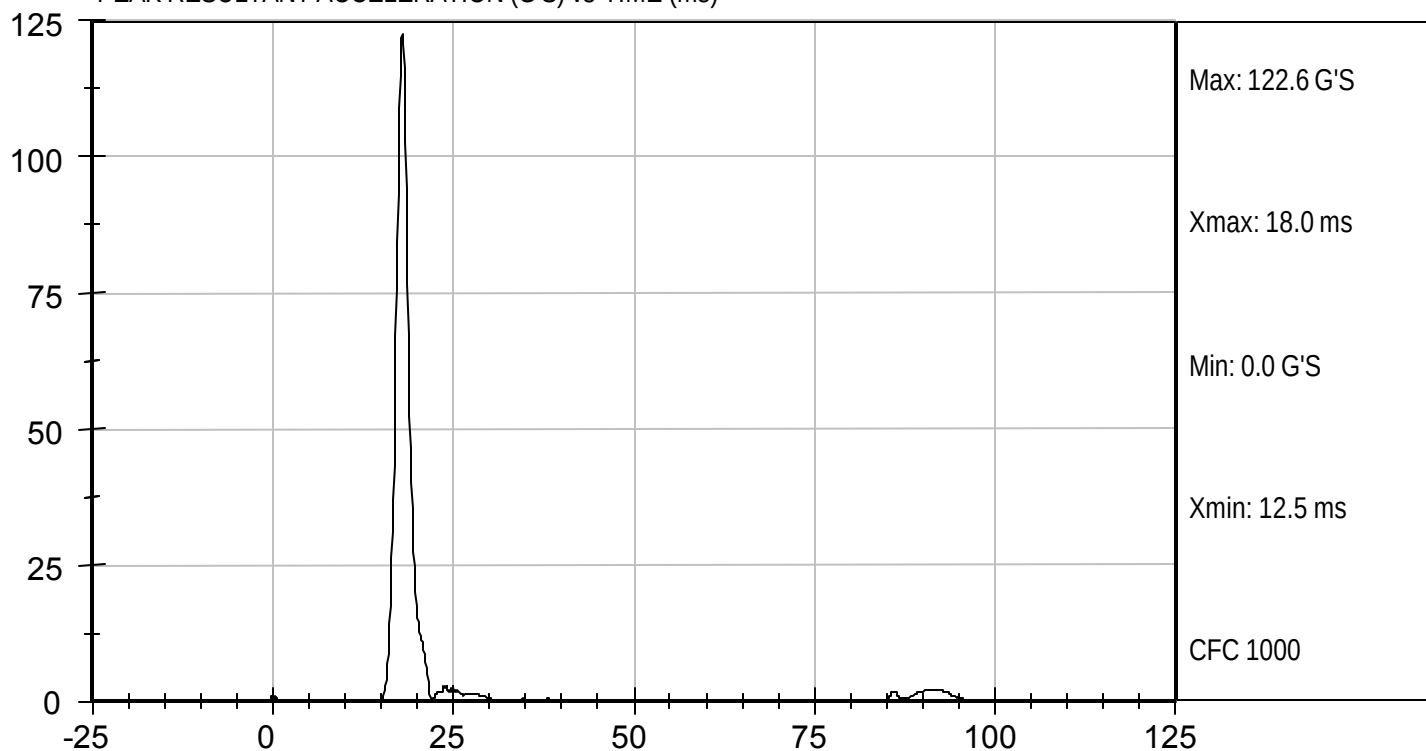
  
Approved By



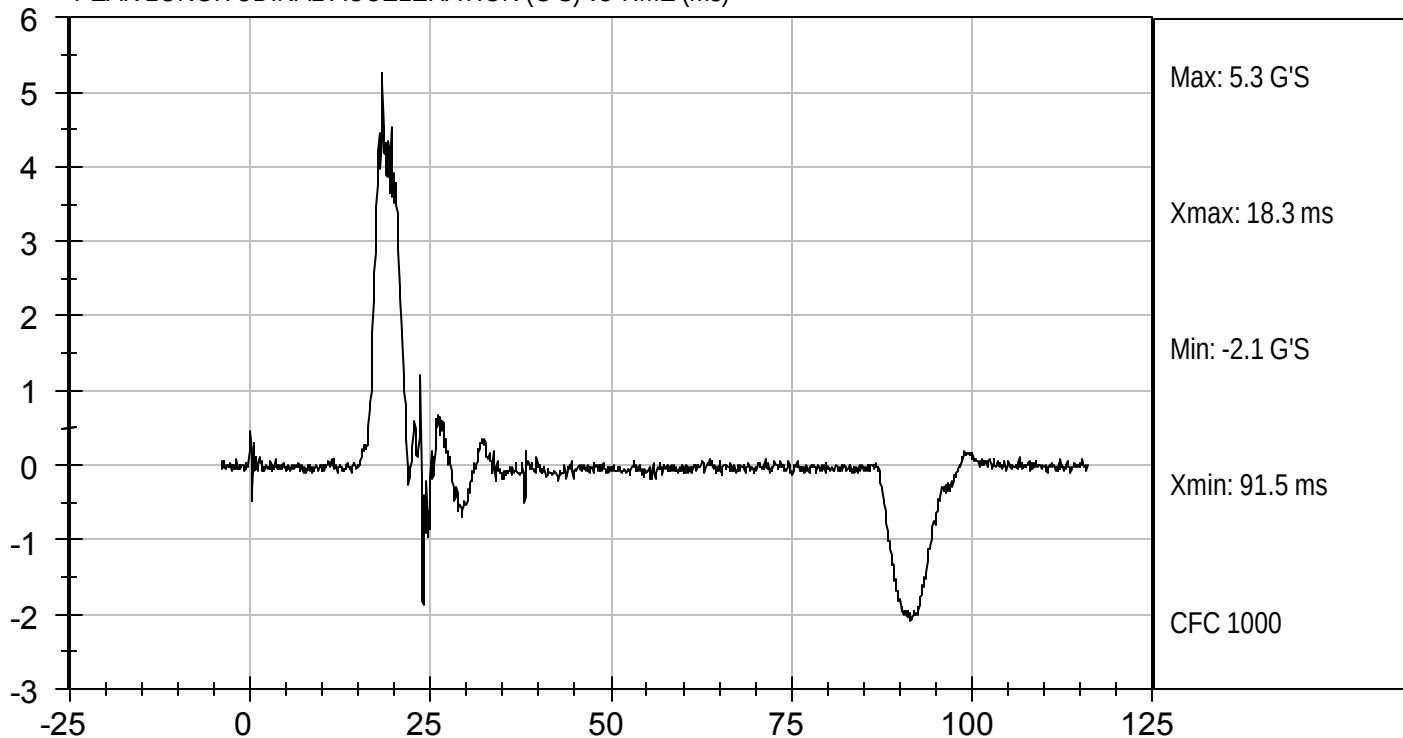
Test Desc: Head Drop  
Component ID: D09891

Test Date: 4/24/09  
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (ms)



PEAK LONGITUDINAL ACCELERATION (G'S) vs TIME (ms)

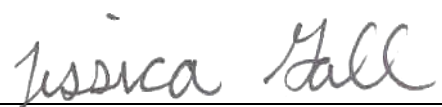


**MGA RESEARCH CORPORATION**  
**LATERAL NECK PENDULUM TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09892

| Tested Parameter                                          |             | Units | Specification | Result | Pass/Fail |
|-----------------------------------------------------------|-------------|-------|---------------|--------|-----------|
| Temperature                                               |             | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                                                  |             | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                                           |             | m/s   | 5.51 to 5.63  | 5.60   | Pass      |
| Delta Velocity                                            | 10 msec     | m/s   | 2.20 to 2.80  | 2.50   | Pass      |
|                                                           | 15 msec     | m/s   | 3.30 to 4.10  | 3.56   | Pass      |
|                                                           | 20 msec     | m/s   | 4.40 to 5.40  | 4.79   | Pass      |
|                                                           | 25 msec     | m/s   | 5.40 to 6.10  | 5.69   | Pass      |
|                                                           | 25-100 msec | m/s   | 5.50 to 6.20  | 5.73   | Pass      |
| Maximum D-Plane Rotation                                  |             | deg   | 71 to 81      | 71     | Pass      |
| Time of Maximum D-Plane Rotation                          |             | msec  | 50 to 70      | 60     | Pass      |
| Maximum Occipital Condyle Moment during Rotation Interval |             | Nm    | -44 to -36    | -44    | Pass      |
| Time of Moment Decay to 0 Nm                              |             | msec  | 102 to 126    | 113    | Pass      |
| Overall Test Results                                      |             |       |               | Pass   |           |

  
 Laboratory Technician

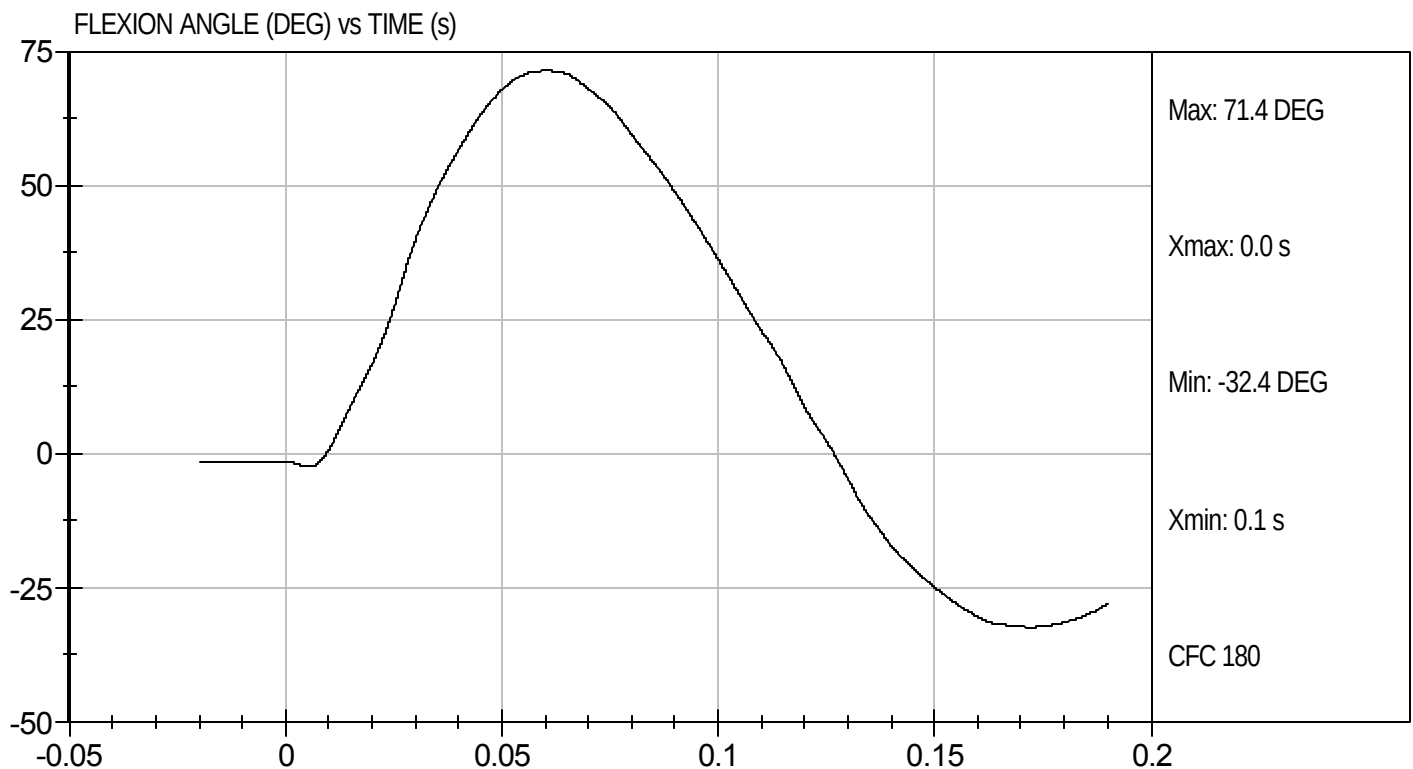
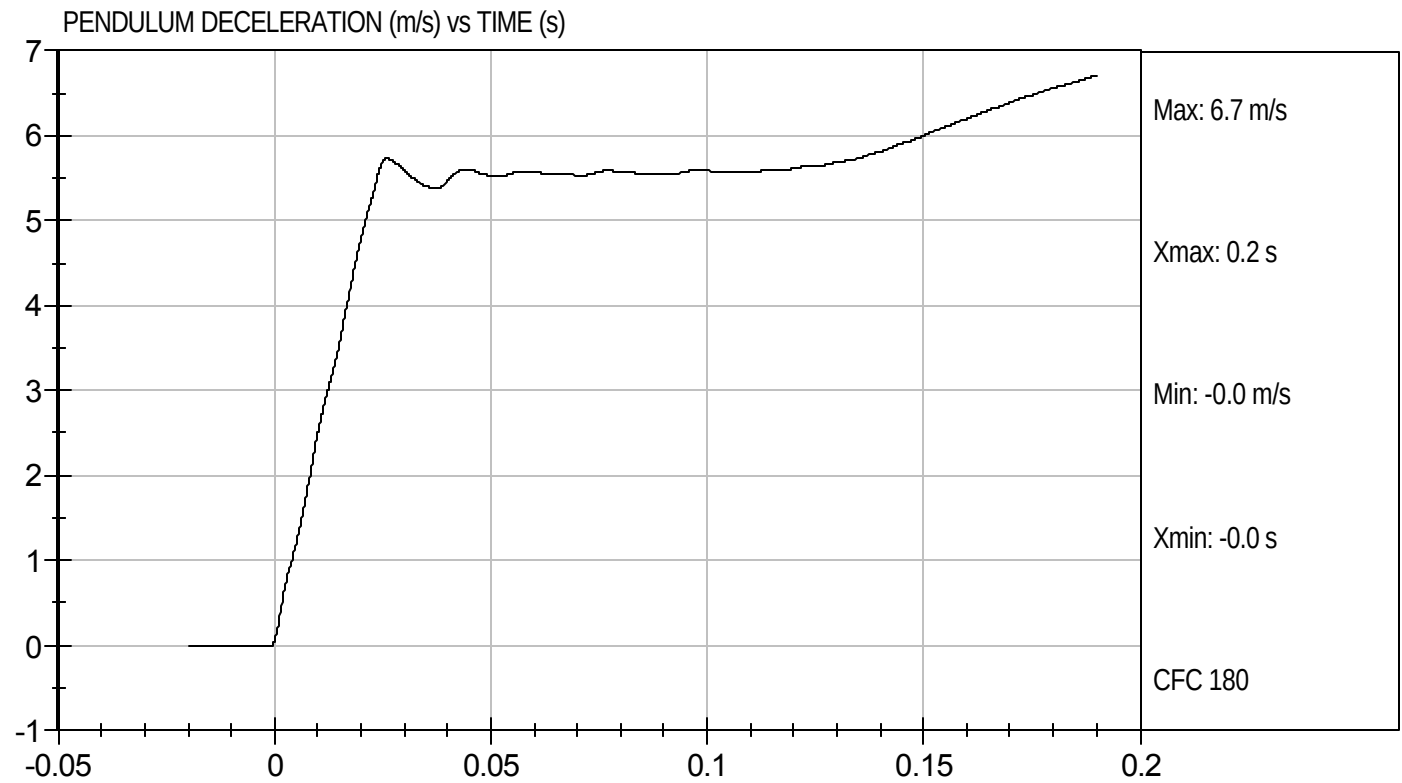
4/24/09  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D09892

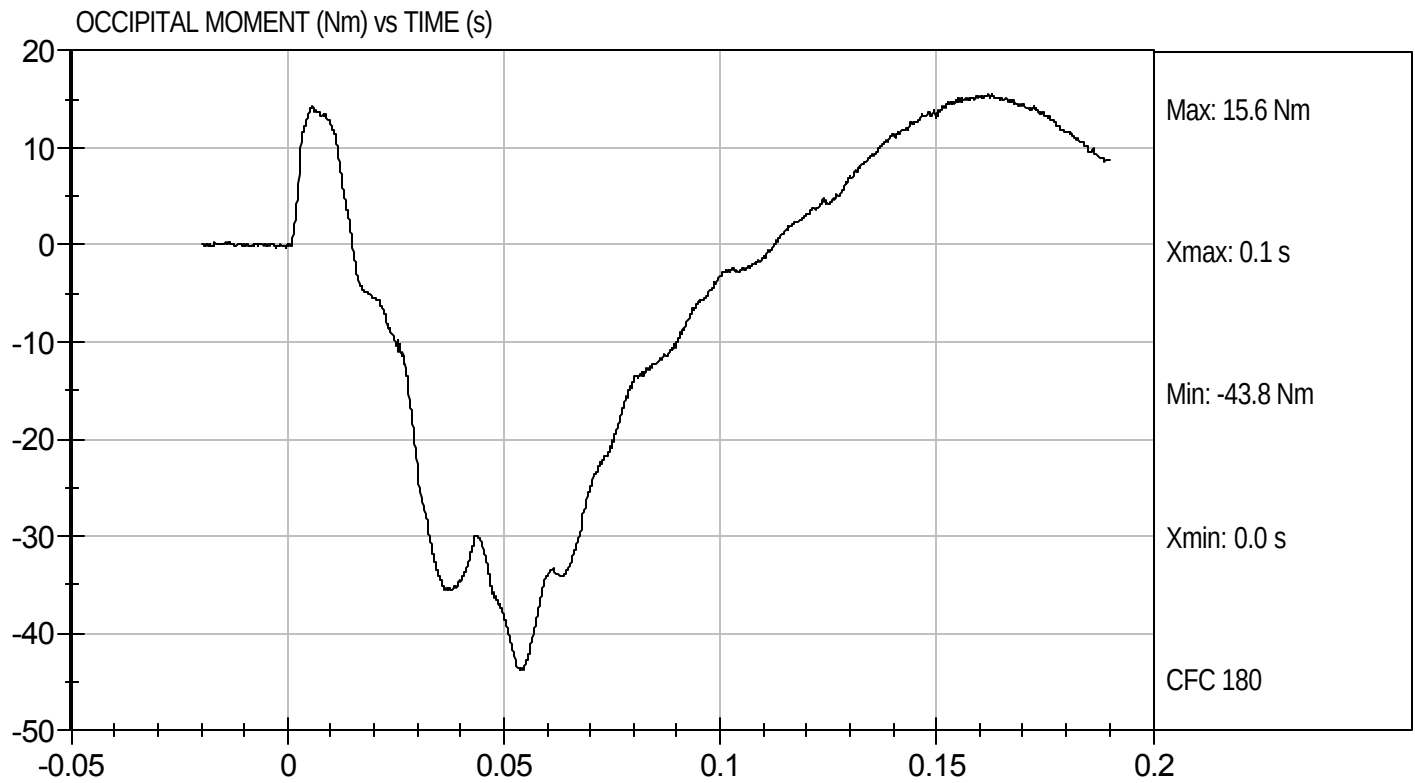
Test Date: 4/24/09  
Velocity: 18.37 ft/s, 5.60 m/s





Test Desc: Neck Bending  
Component ID: D09892

Test Date: 4/24/09  
Velocity: 18.37 ft/s, 5.60 m/s

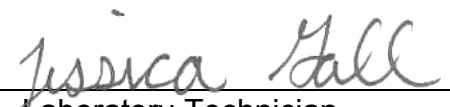


**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D09893

| Tested Parameter                | Units | Specification | Result | Pass/Fail |
|---------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 21.6   | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                 | m/s   | 4.20 to 4.40  | 4.38   | Pass      |
| Maximum Probe Acceleration      | G's   | 13 to 18      | 16     | Pass      |
| Shoulder Displacement           | mm    | 28 to 37      | 31     | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 19     | Pass      |
| Overall Test Results            |       |               | Pass   |           |

  
Laboratory Technician

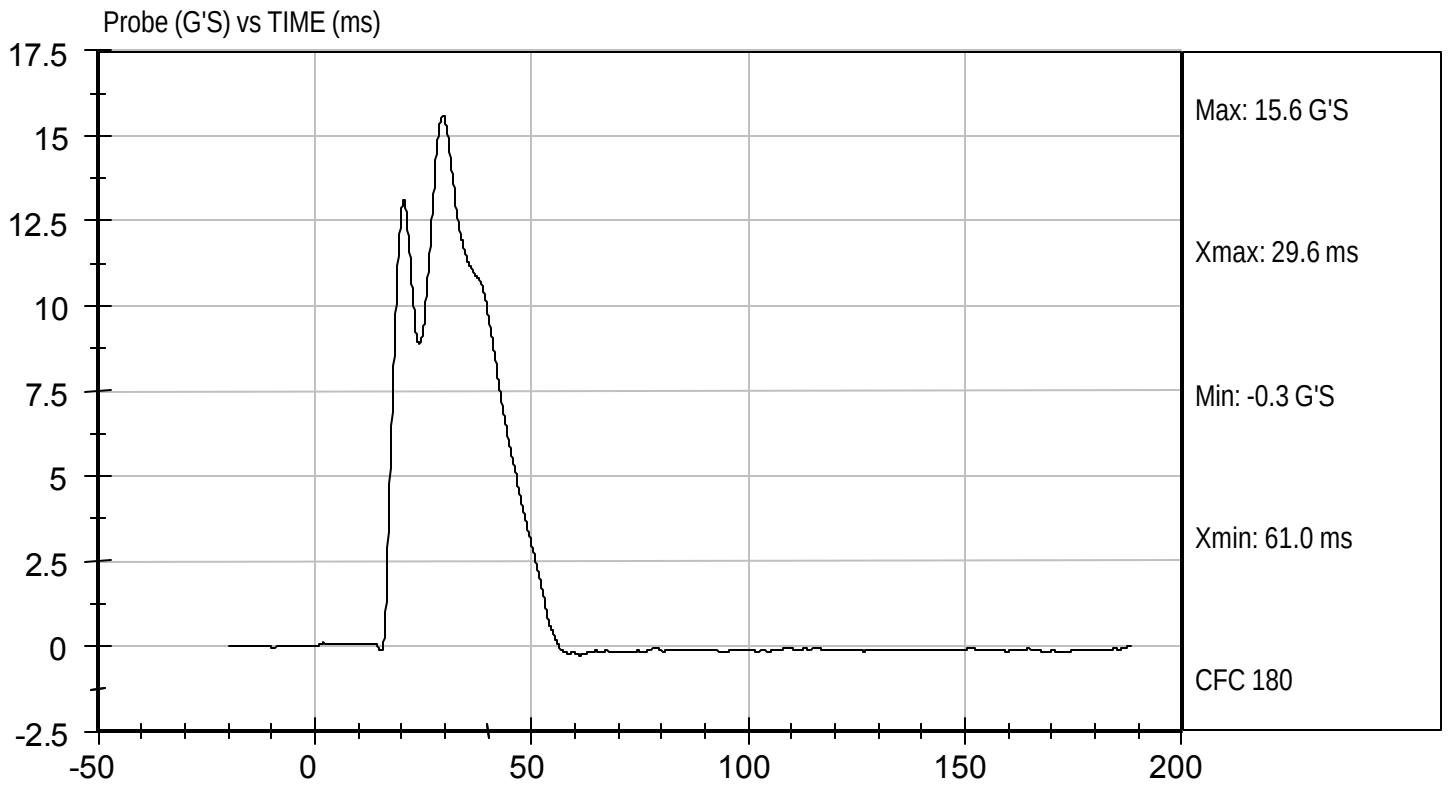
4/24/09  
Test Date

  
Approved By



Test Desc: Shoulder Impact  
Component ID: D09893

Test Date: 4/24/09  
Velocity: 14.37 ft/s, 4.38 m/s

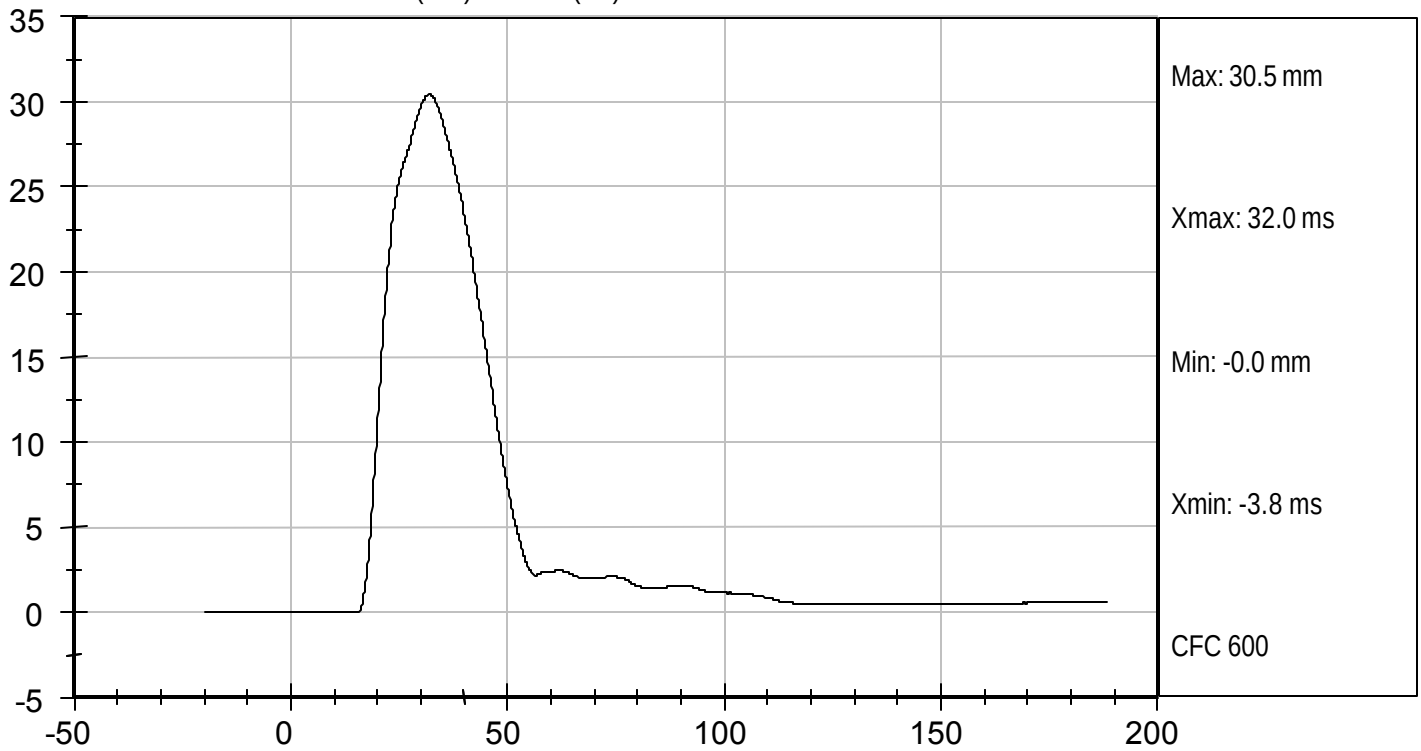




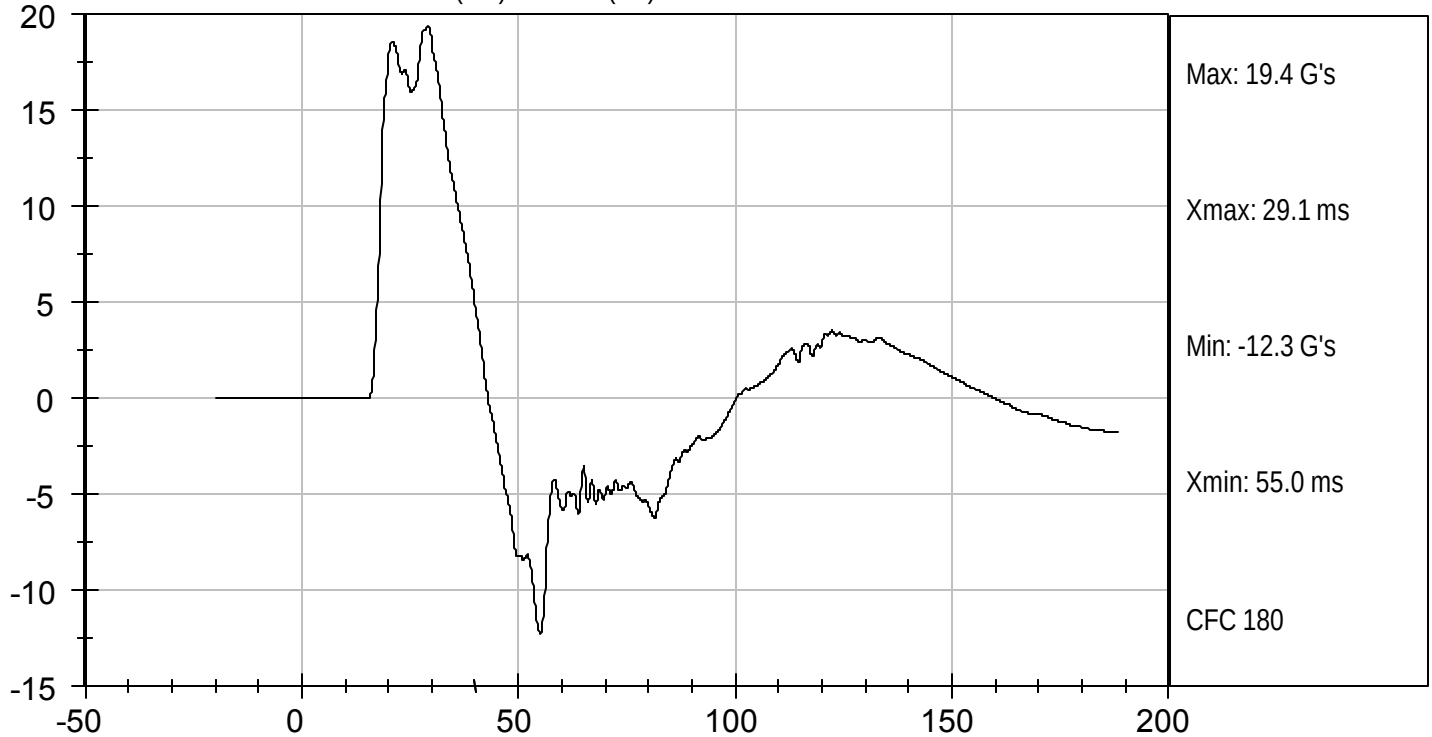
Test Desc: Shoulder Impact  
Component ID: D09893

Test Date: 4/24/09  
Velocity: 14.37 ft/s, 4.38 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER SPINE ACCELERATION (G's) vs TIME (ms)

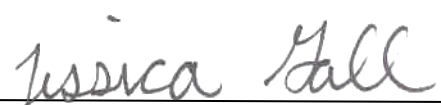


**MGA RESEARCH CORPORATION**  
**THORAX (WITH ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09894

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.6   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Peak Impactor Acceleration       | G's   | 31 to 36      | 34     | Pass      |
| Shoulder Displacement            | mm    | 31 to 40      | 33     | Pass      |
| Upper Rib Displacement           | mm    | 25 to 32      | 26     | Pass      |
| Middle Rib Displacement          | mm    | 30 to 36      | 31     | Pass      |
| Lower Rib Displacement           | mm    | 32 to 38      | 34     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 38     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 33     | Pass      |
| Overall Test Results             |       |               | Pass   |           |

  
Laboratory Technician

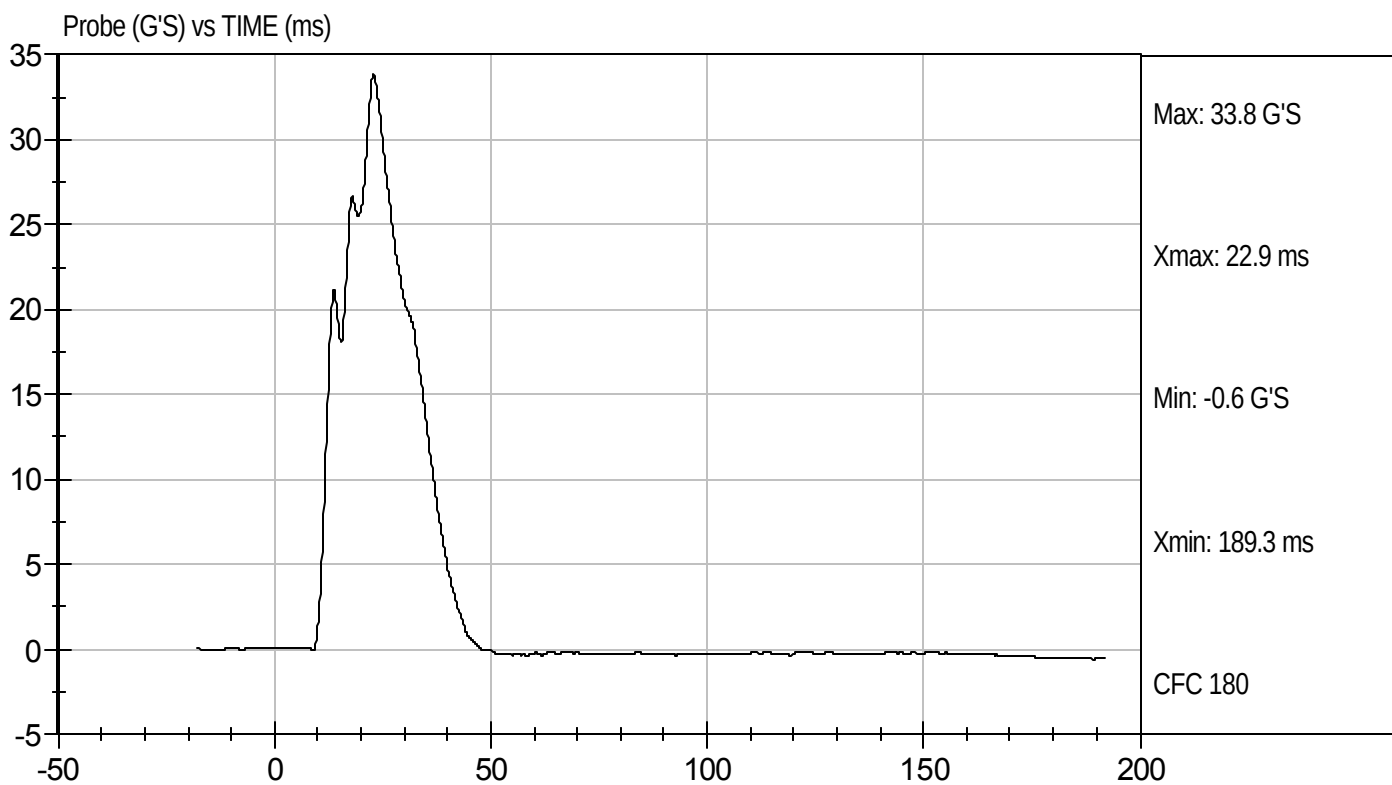
4/24/09  
Test Date

  
Approved By



Test Desc: Thorax With Arm  
Component ID: D09894

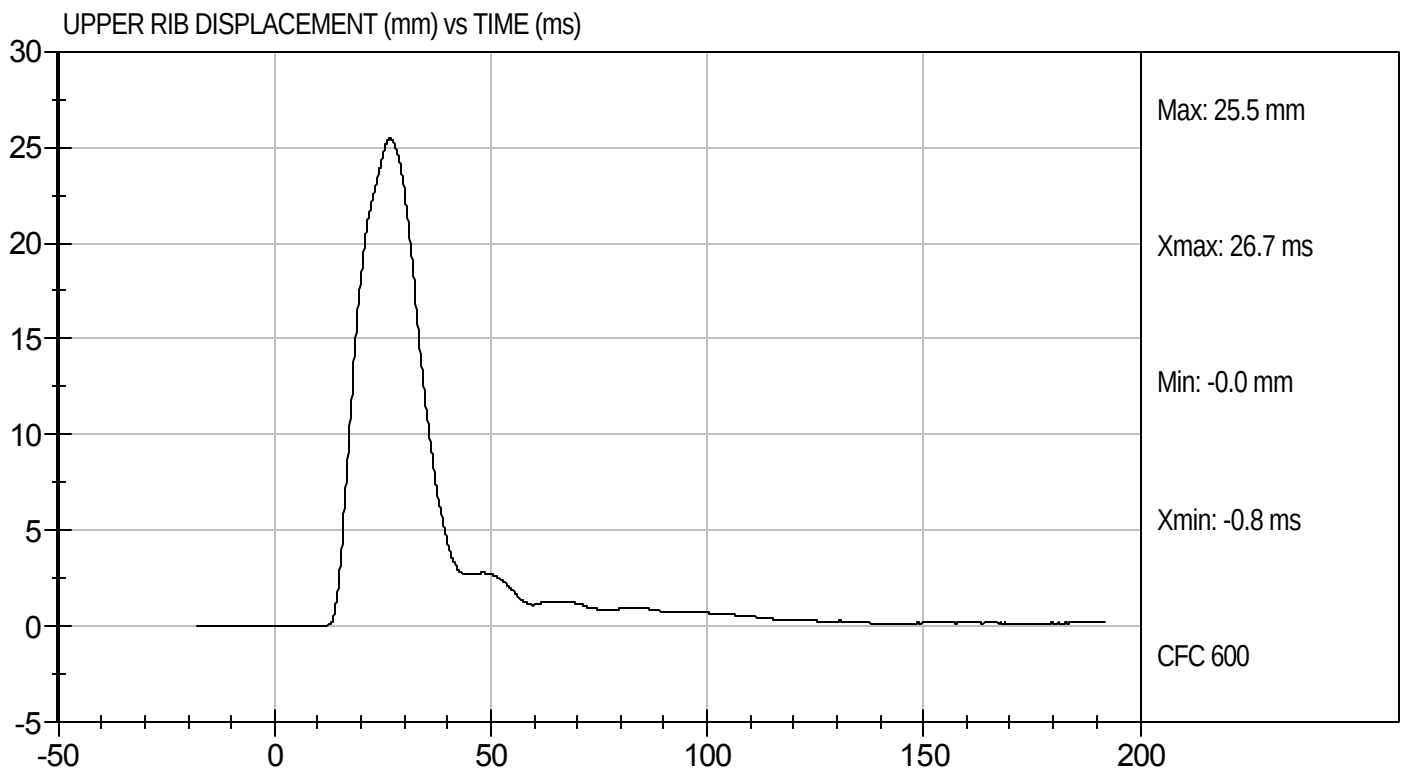
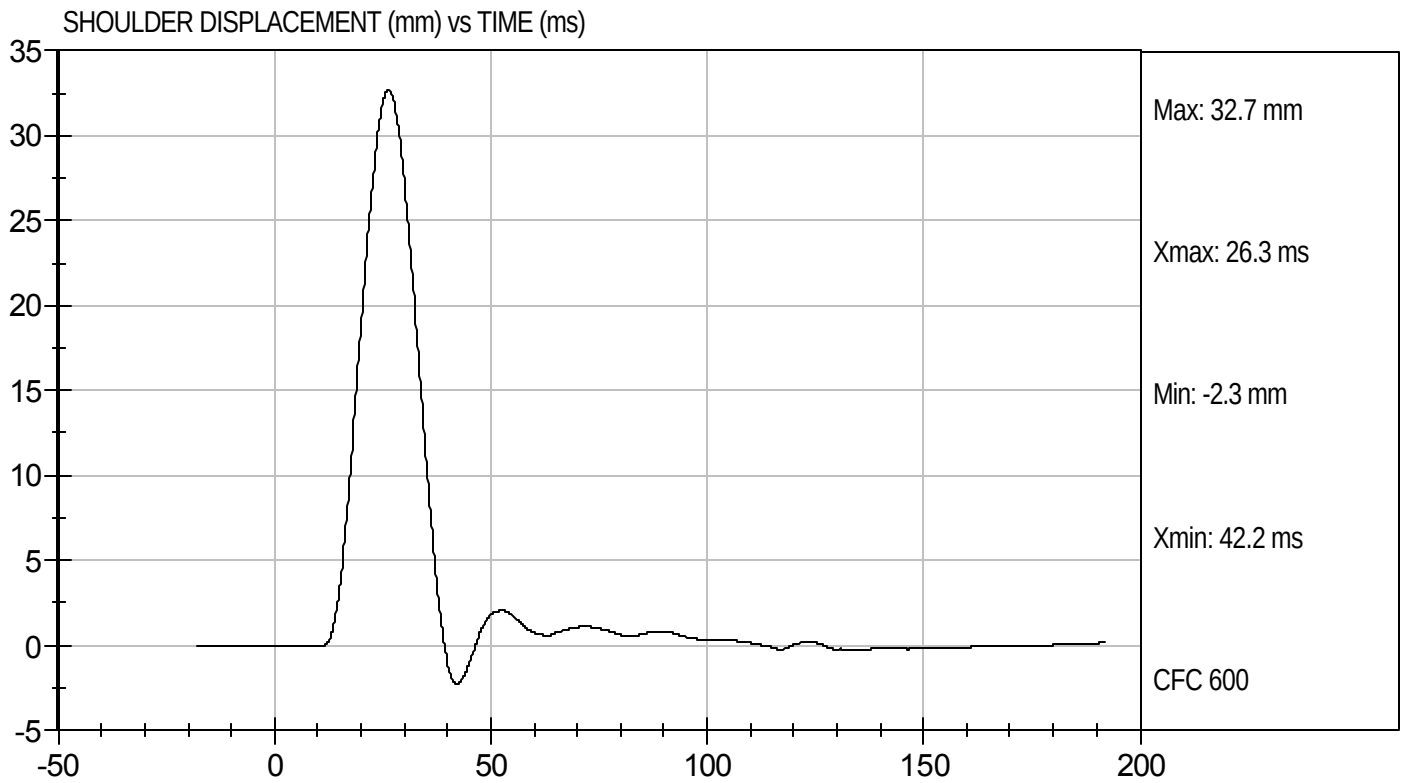
Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm  
Component ID: D09894

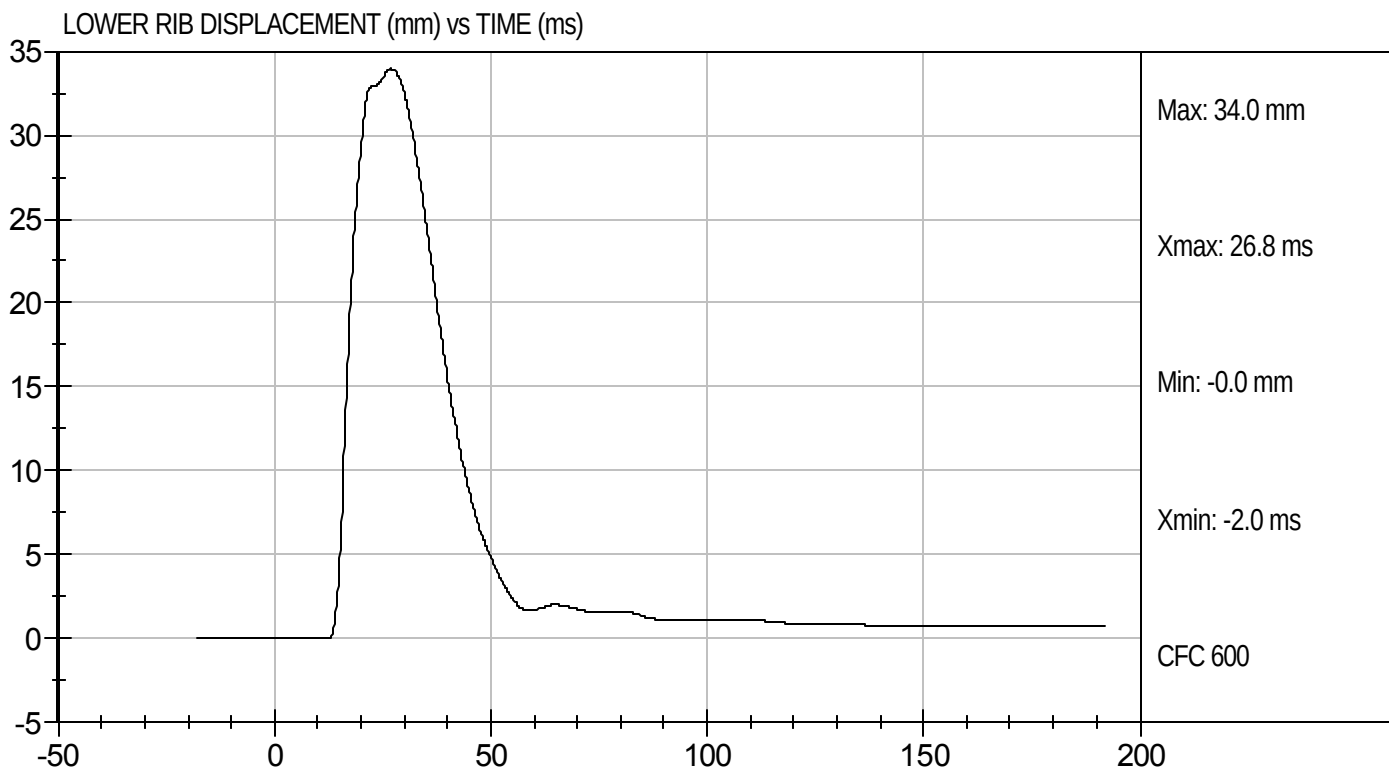
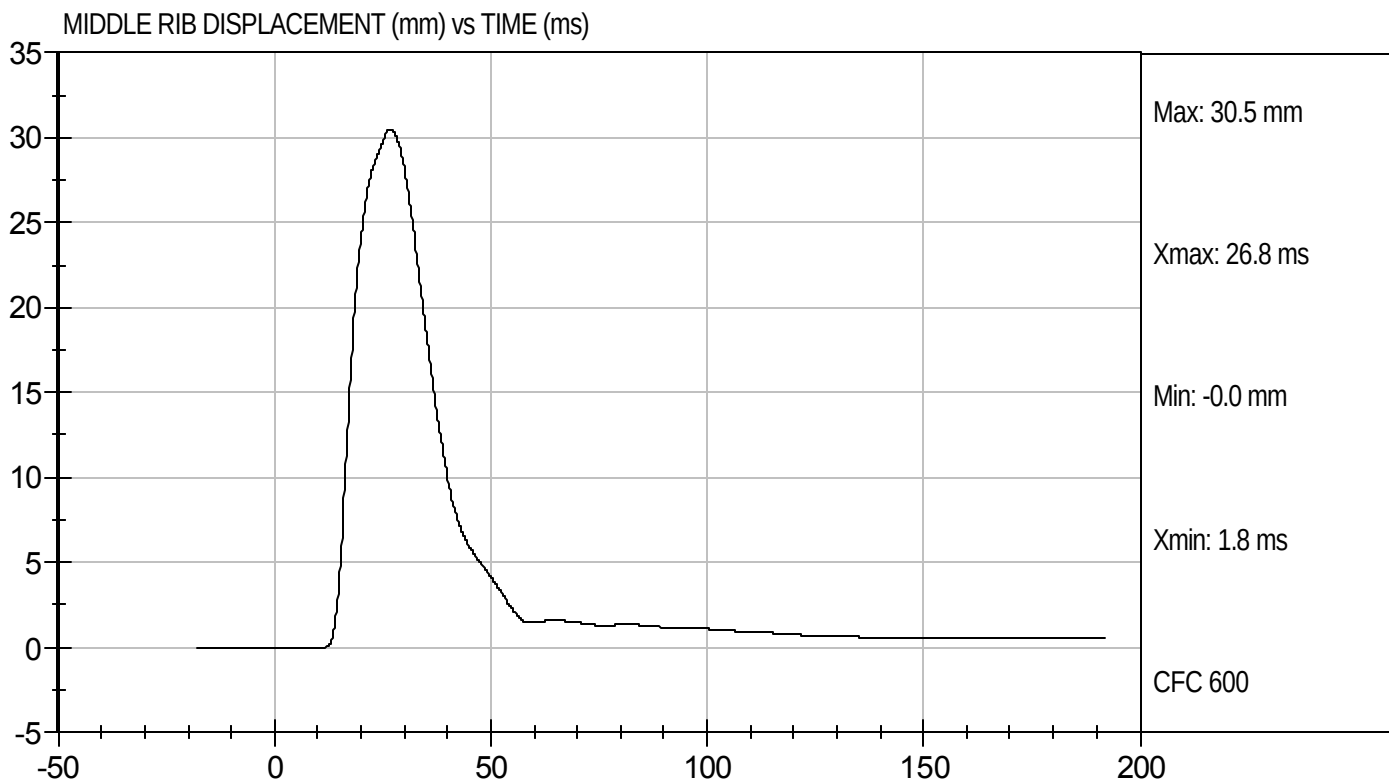
Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm  
Component ID: D09894

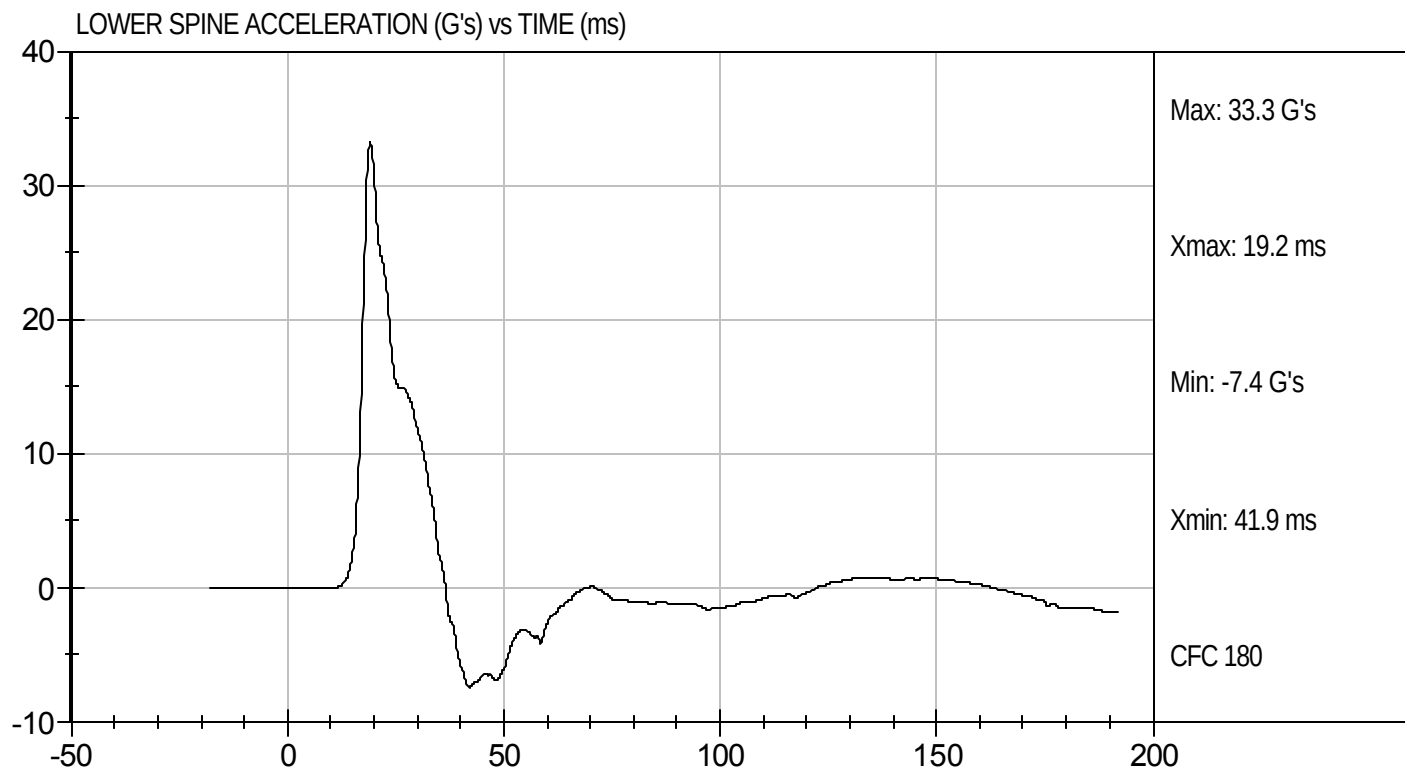
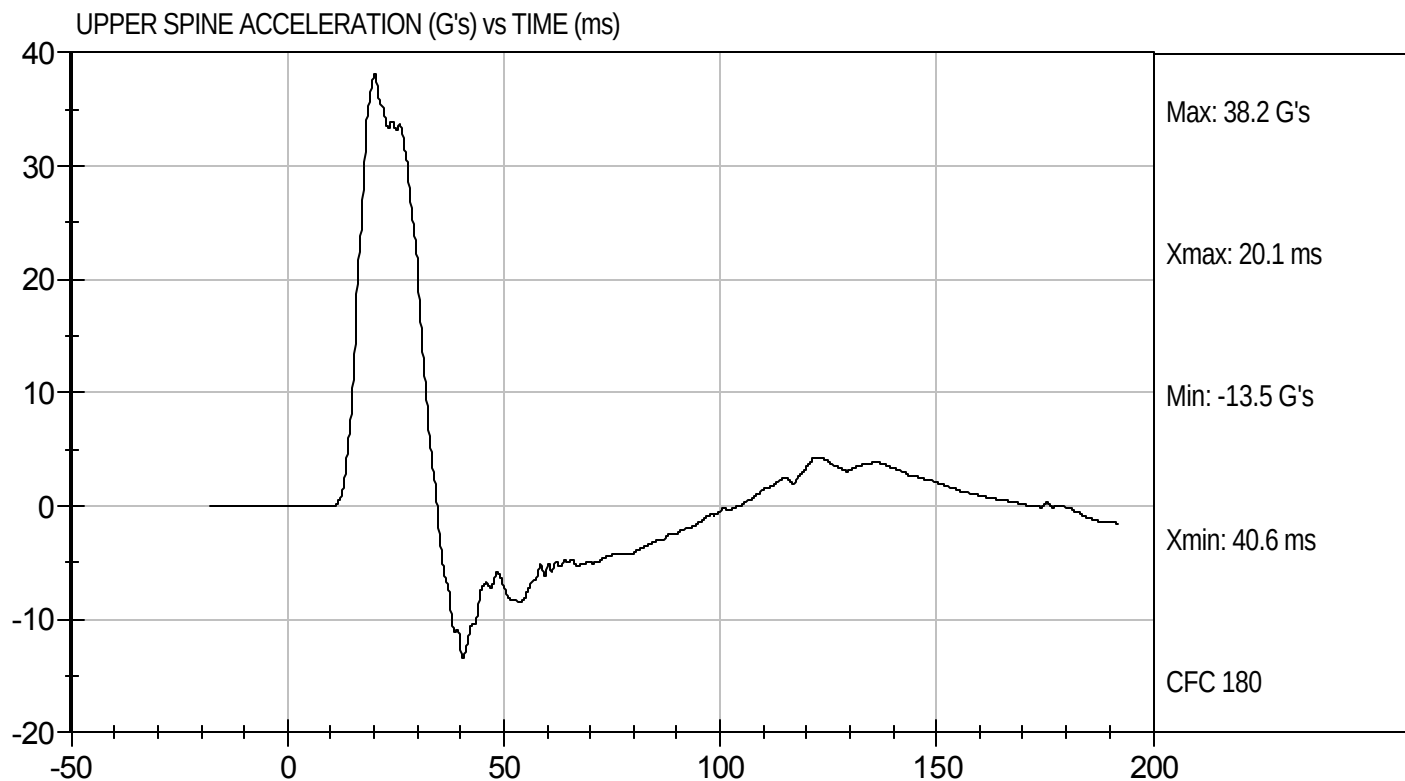
Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Thorax With Arm  
Component ID: D09894

Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-11s BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09895

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.6   | Pass      |
| Humidity                         | %     | 10 to 70      | 51     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.34   | Pass      |
| Peak Impactor Force              | G's   | 14 to 18      | 15     | Pass      |
| Upper Rib Displacement           | mm    | 32 to 40      | 36     | Pass      |
| Middle Rib Displacement          | mm    | 39 to 45      | 41     | Pass      |
| Lower Rib Displacement           | mm    | 35 to 43      | 39     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 13 to 17      | 14     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 7 to 11       | 9      | Pass      |
| Overall Test Results             |       |               | Pass   |           |

  
 Laboratory Technician

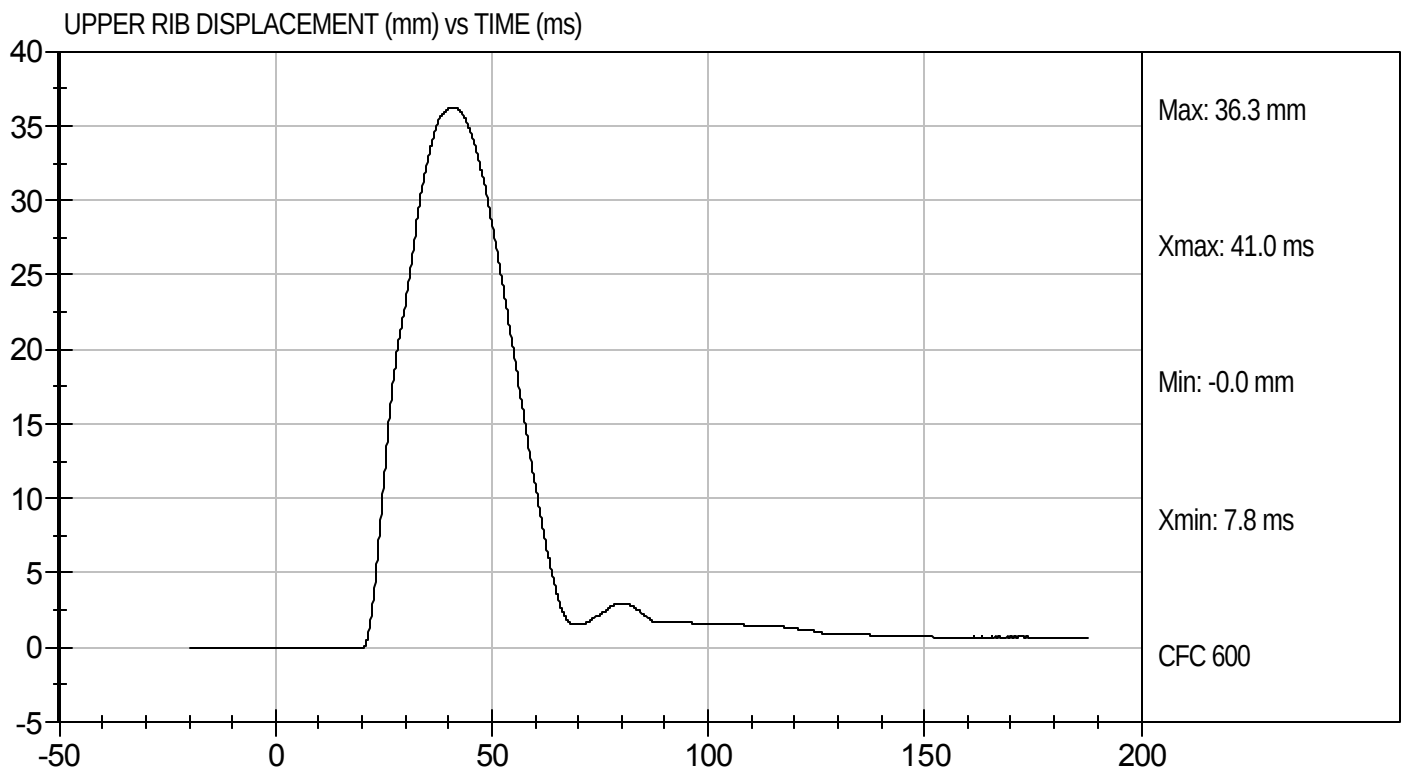
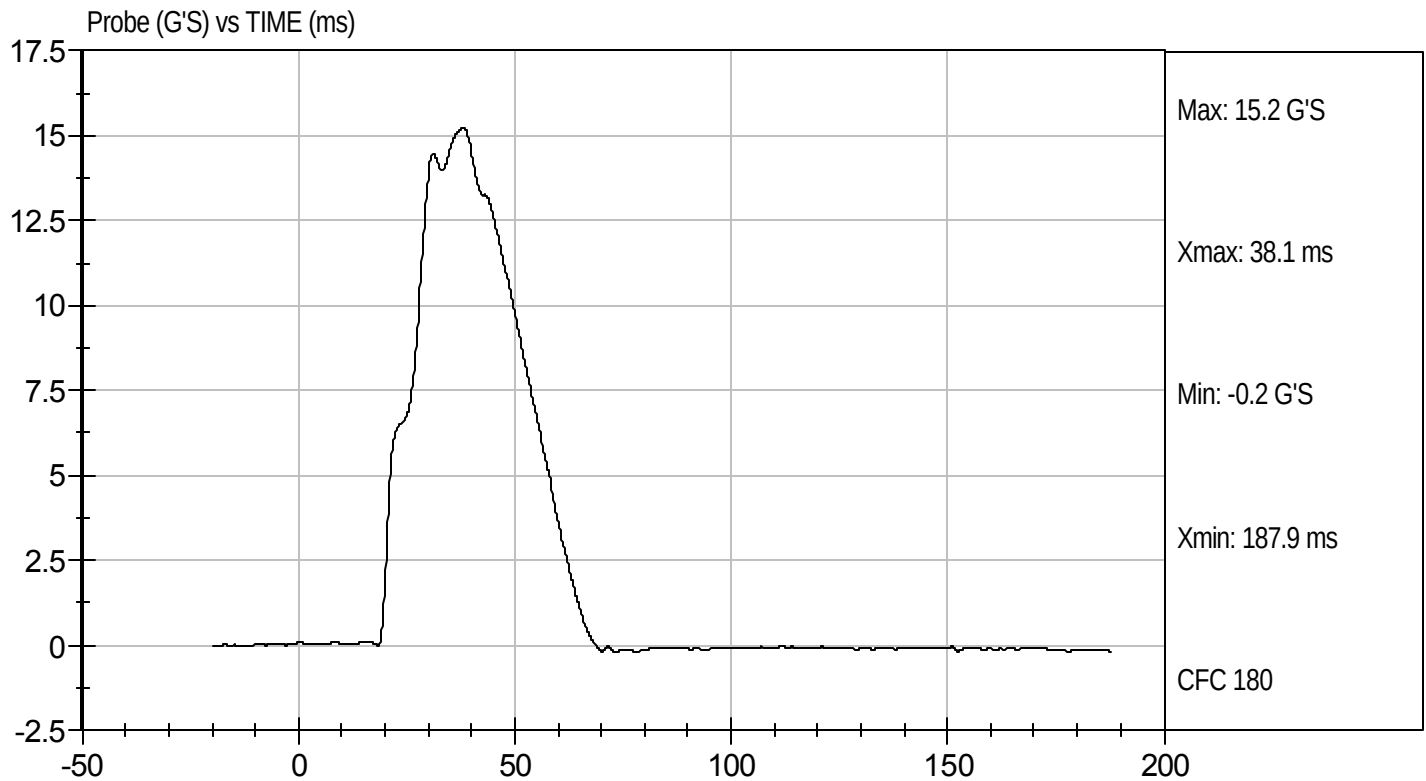
4/24/09  
 Test Date

  
 Approved By



Test Desc: Thorax Without Arm  
Component ID: D09895

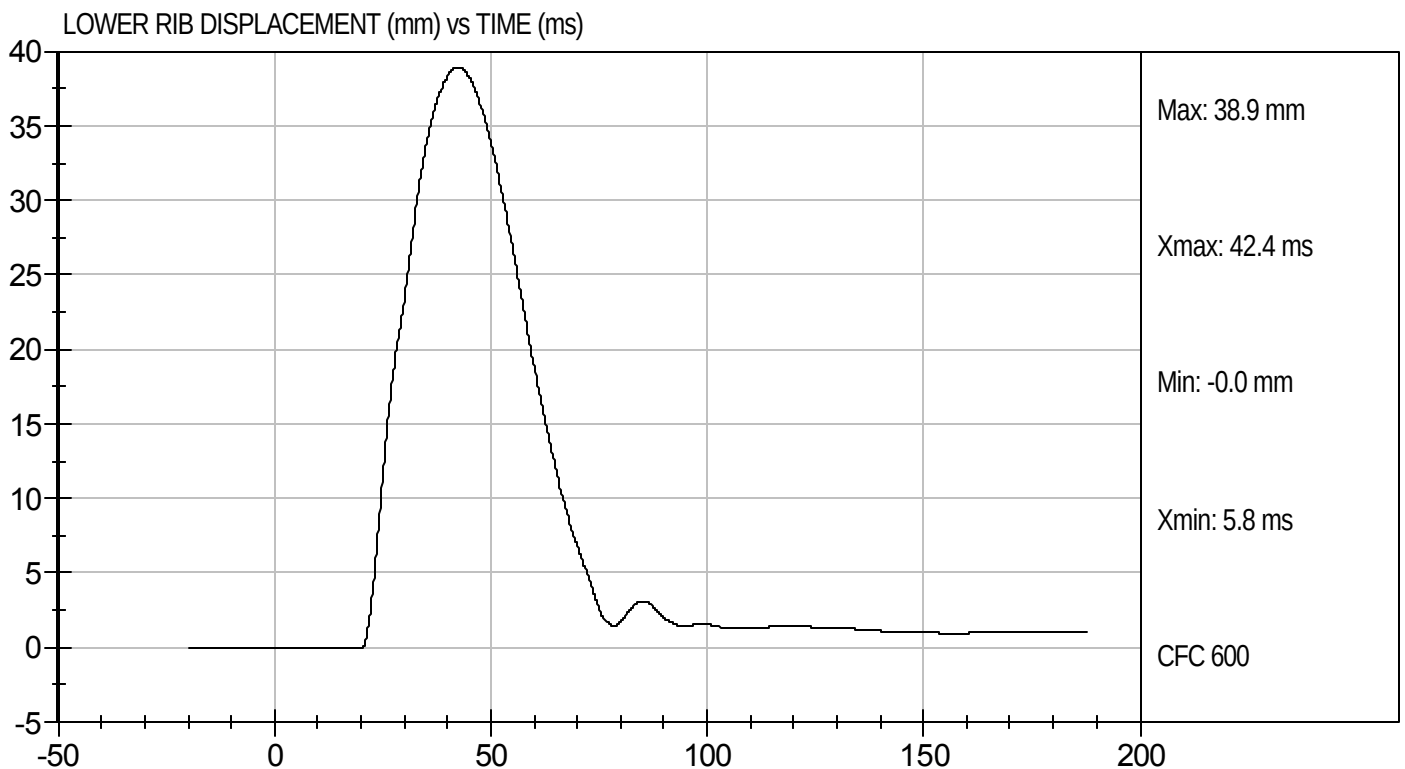
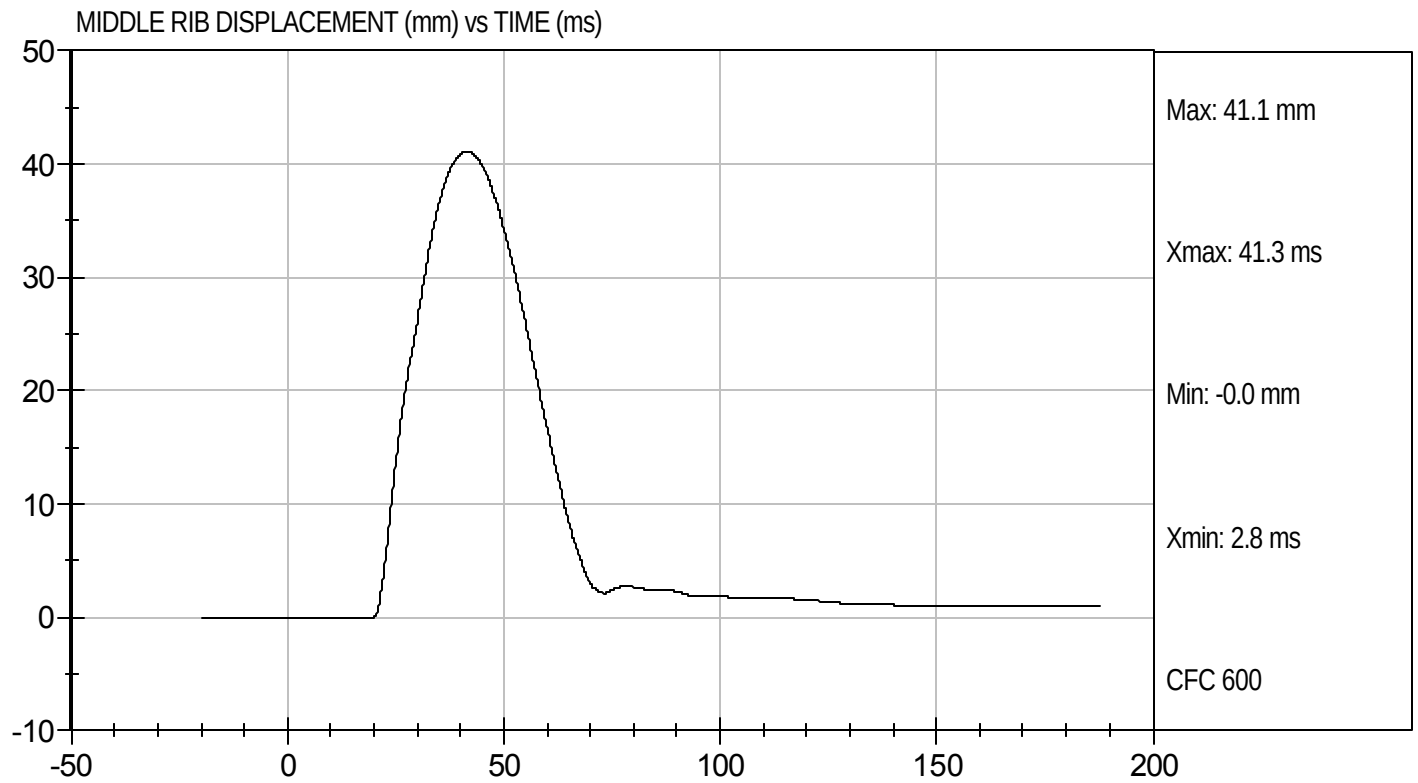
Test Date: 4/24/09  
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm  
Component ID: D09895

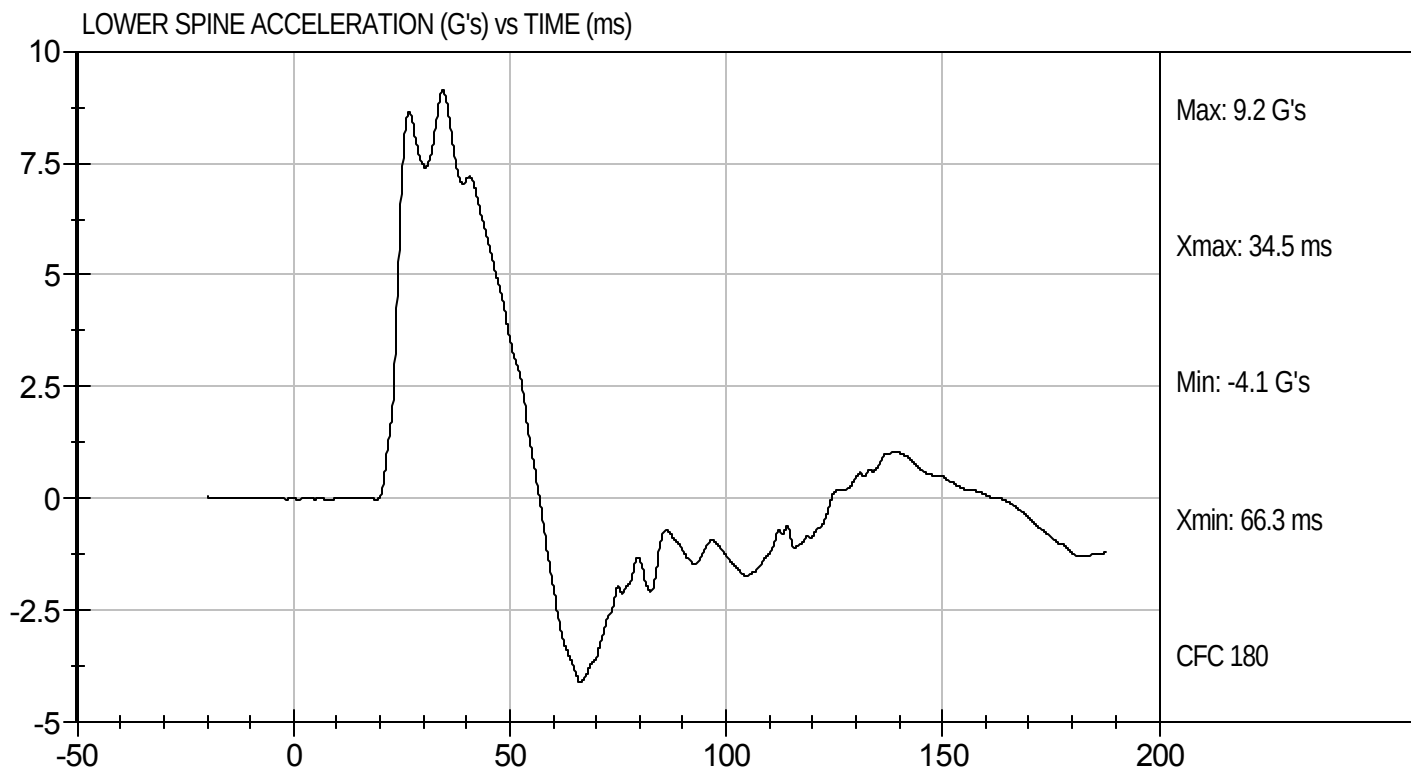
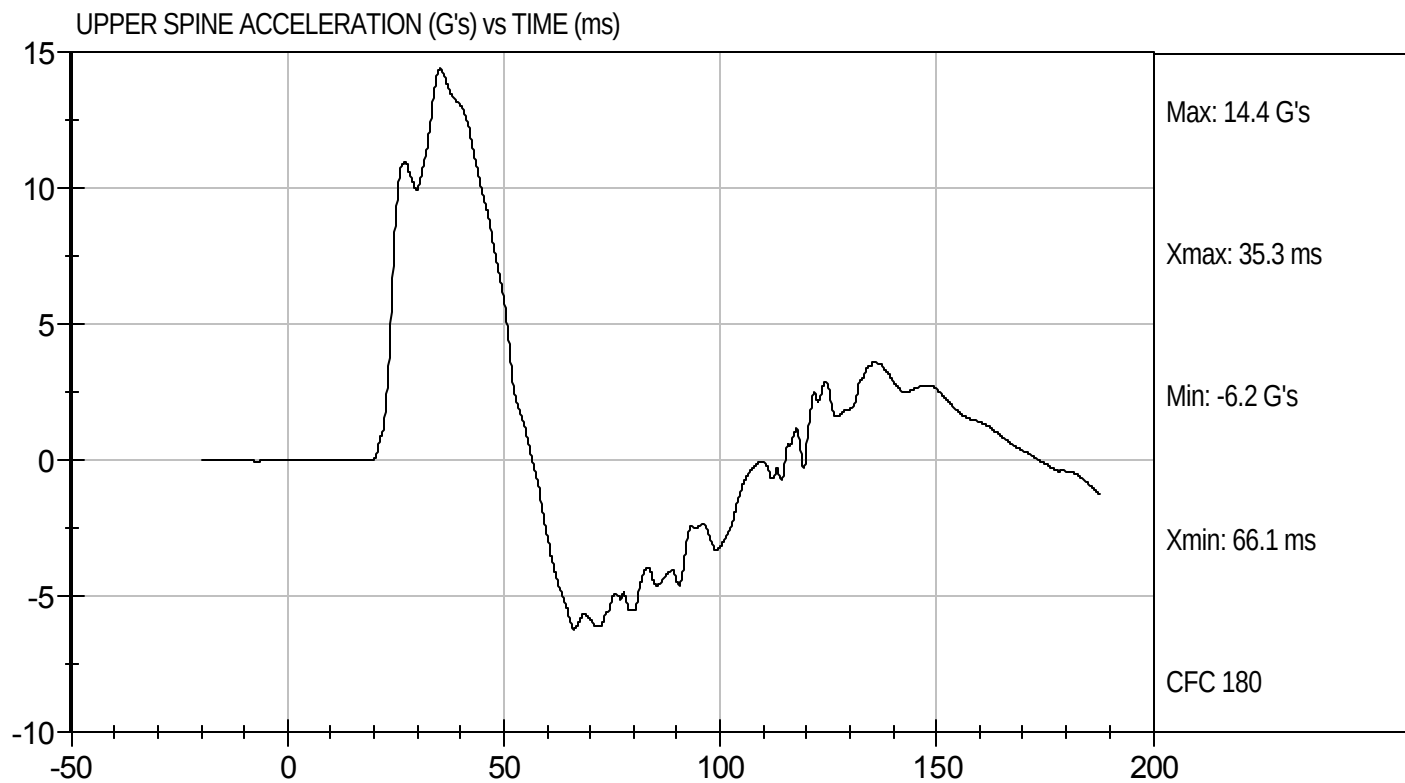
Test Date: 4/24/09  
Velocity: 14.25 ft/s, 4.34 m/s





Test Desc: Thorax Without Arm  
Component ID: D09895

Test Date: 4/24/09  
Velocity: 14.25 ft/s, 4.34 m/s

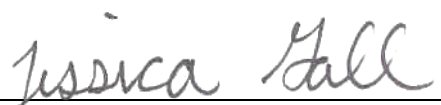


**MGA RESEARCH CORPORATION**  
**ABDOMINAL IMPACT TEST**  
**SID-II's BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09896

| Tested Parameter                 | Units | Specification | Result               | Pass/Fail |
|----------------------------------|-------|---------------|----------------------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.6                 | Pass      |
| Humidity                         | %     | 10 to 70      | 51                   | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.30                 | Pass      |
| Peak Impactor Acceleration       | G's   | 12 to 16      | 14                   | Pass      |
| Upper Rib Displacement           | mm    | 36 to 47      | 39                   | Pass      |
| Lower Rib Displacement           | mm    | 33 to 44      | 38                   | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 11                   | Pass      |
|                                  |       |               | Overall Test Results | Pass      |

  
Laboratory Technician

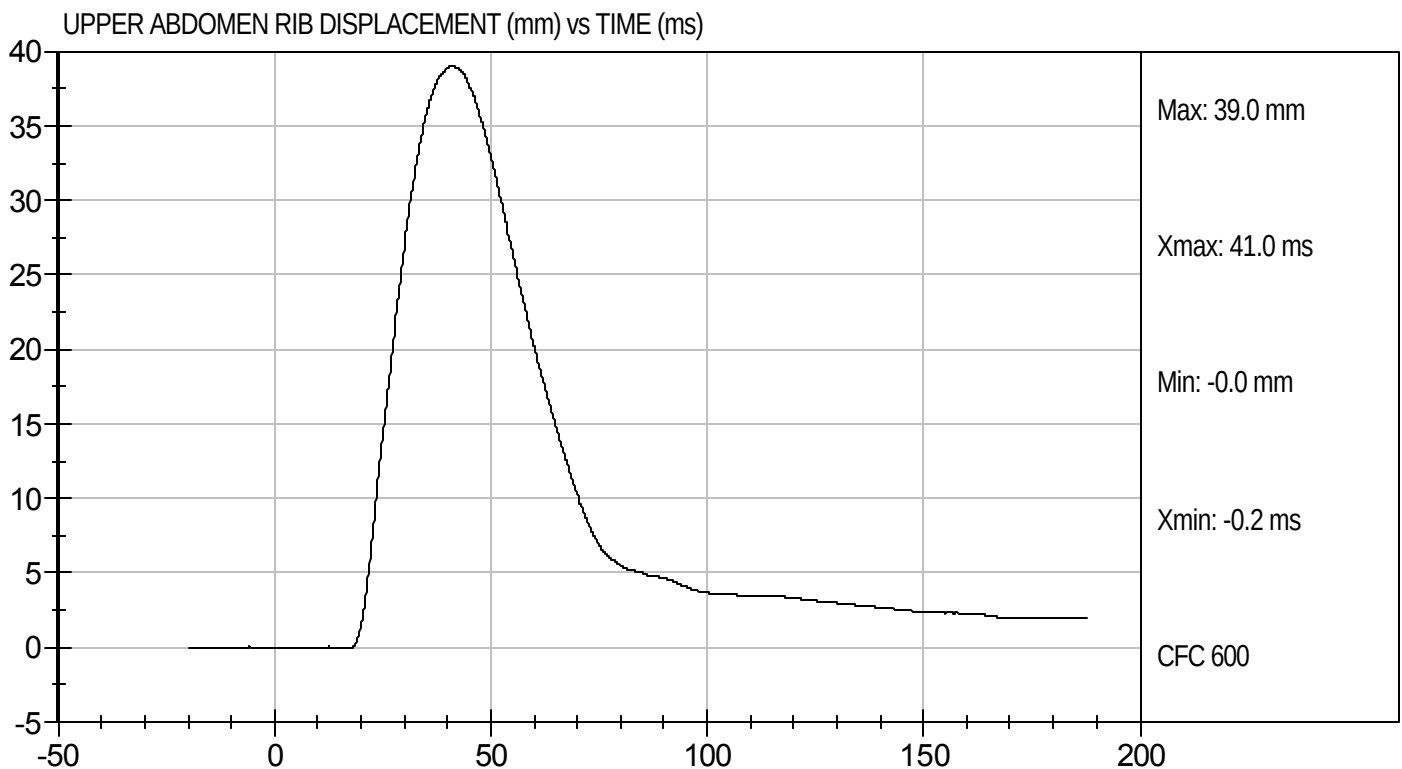
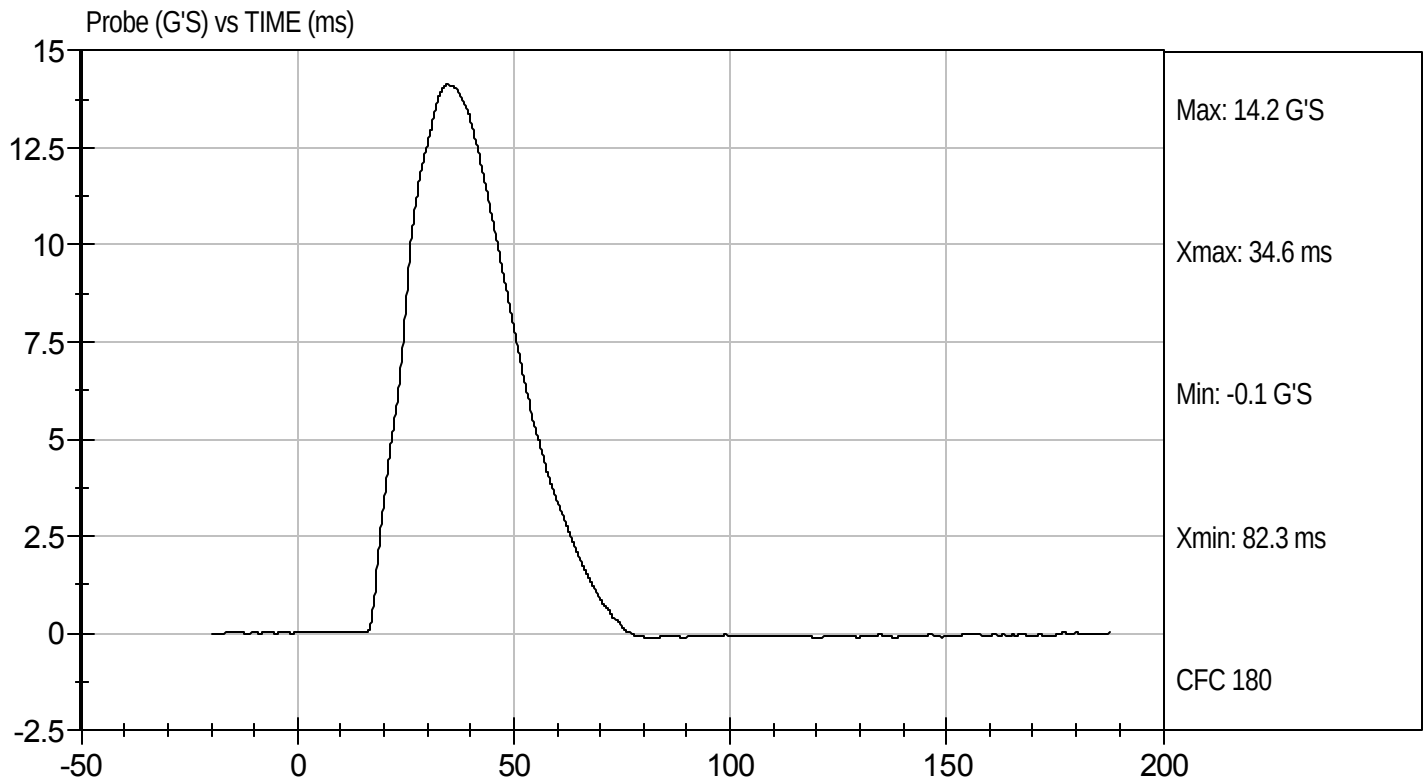
4/24/09  
Test Date

  
Approved By



Test Desc: Abdomen Impact  
Component ID: D09896

Test Date: 4/24/09  
Velocity: 14.12 ft/s, 4.30 m/s

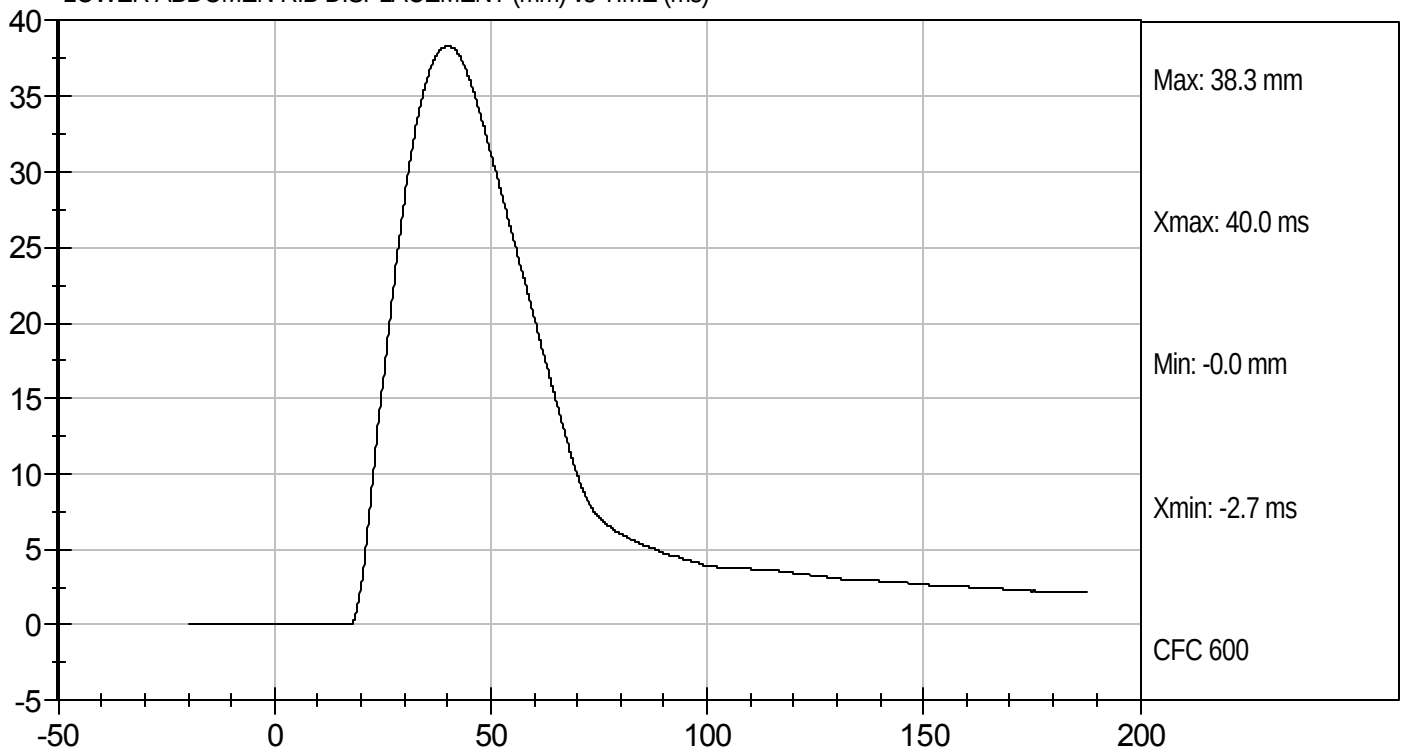




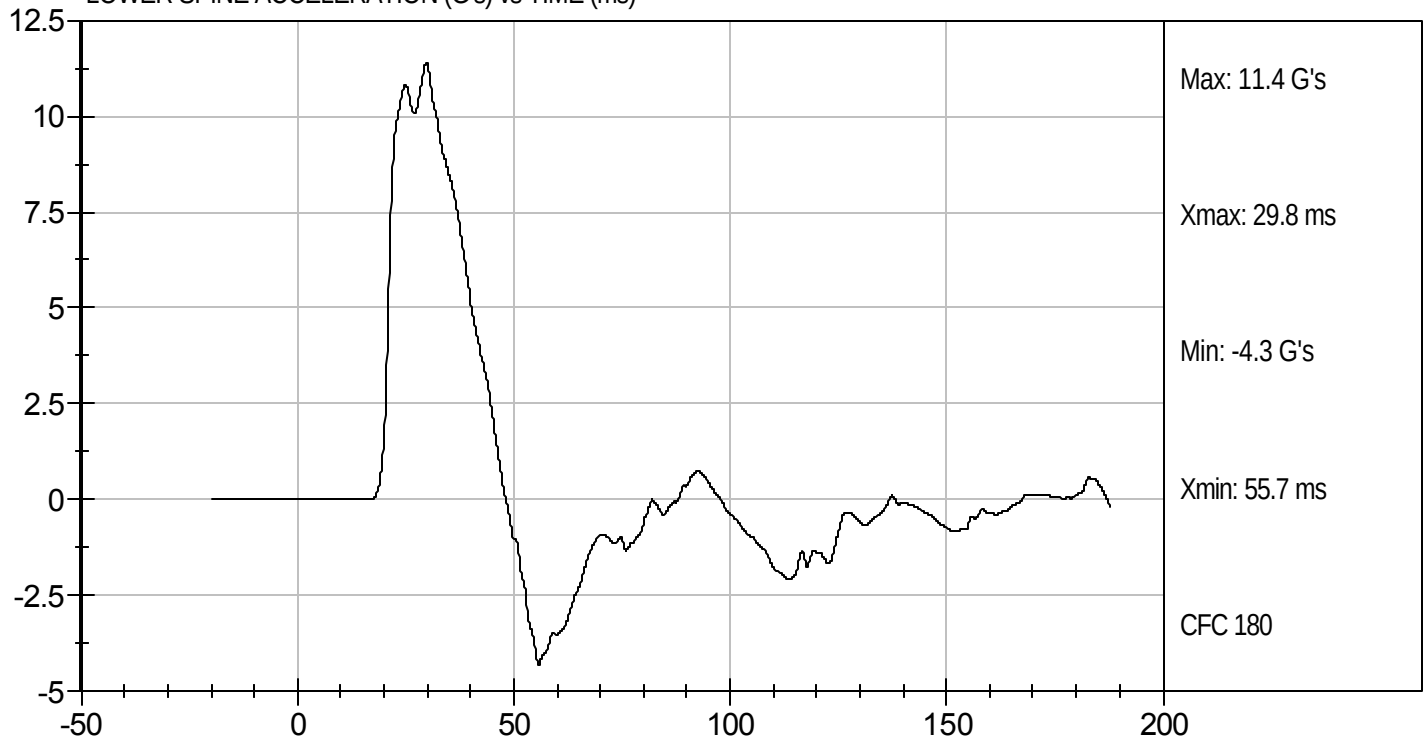
Test Desc: Abdomen Impact  
Component ID: D09896

Test Date: 4/24/09  
Velocity: 14.12 ft/s, 4.30 m/s

LOWER ABDOMEN RIB DISPLACEMENT (mm) vs TIME (ms)



LOWER SPINE ACCELERATION (G's) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**PELVIS IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09897

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                         | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Peak Impactor Acceleration       | G's   | 38 to 47      | 44     | Pass      |
| Pelvis Y Acceleration after 6 ms | G's   | 34 to 42      | 40     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4101   | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

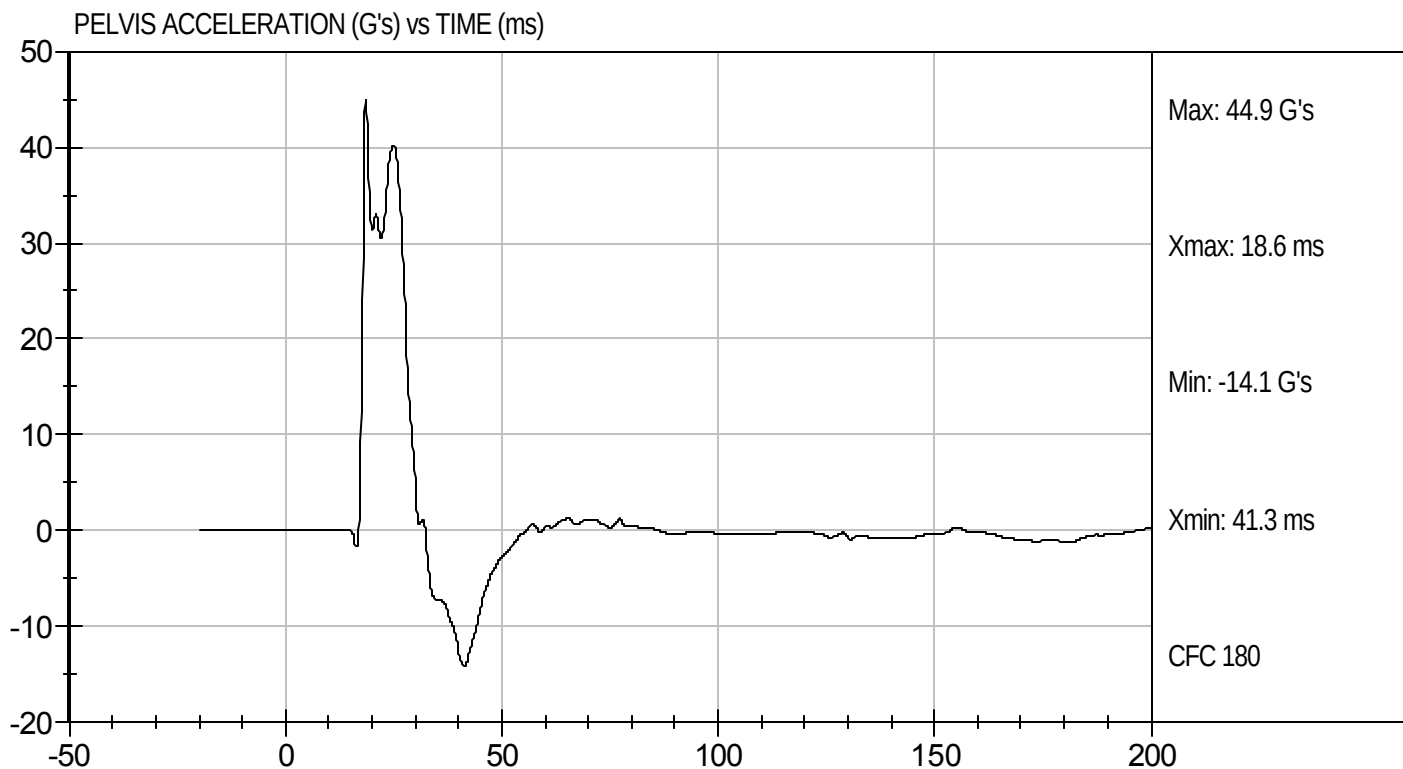
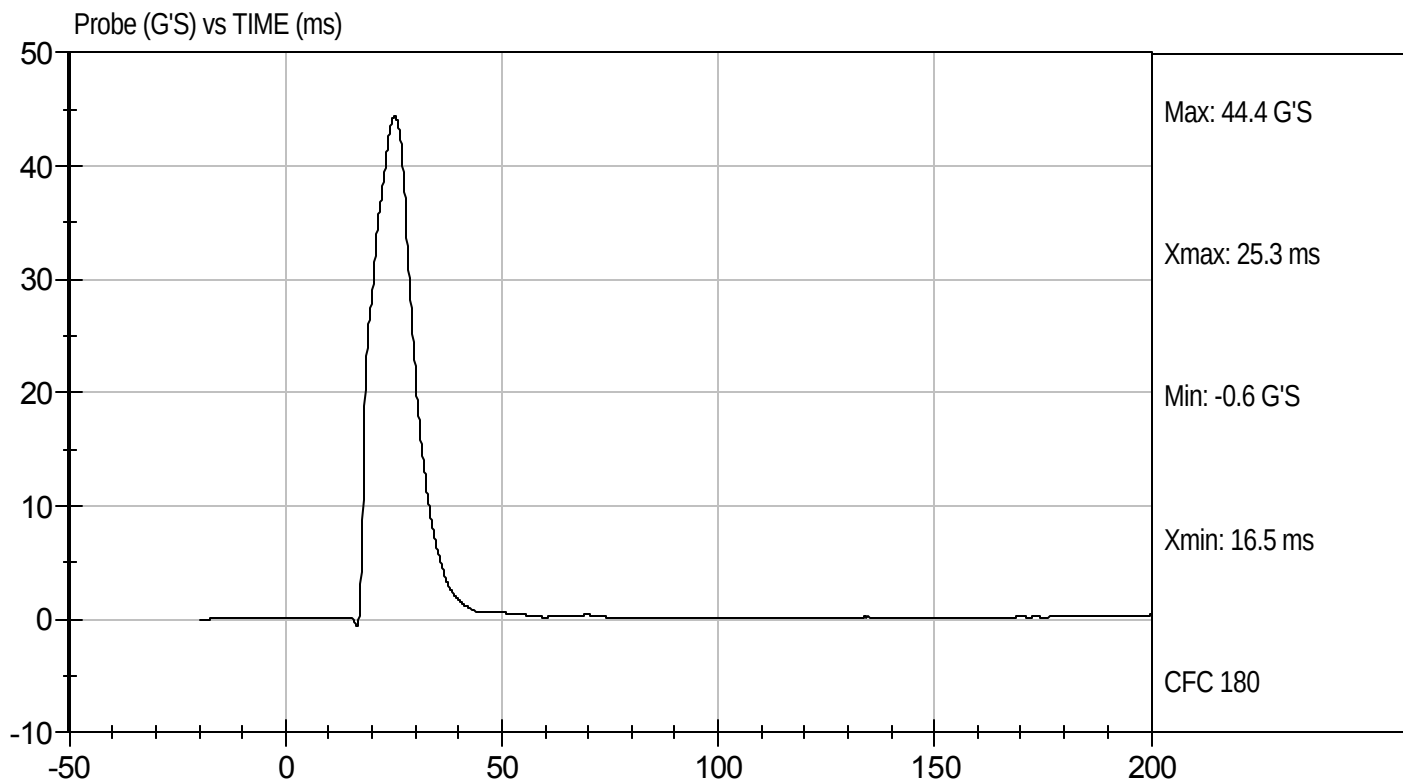
4/24/09  
Test Date

  
Approved By



Test Desc: Pelvis Impact  
Component ID: D09897

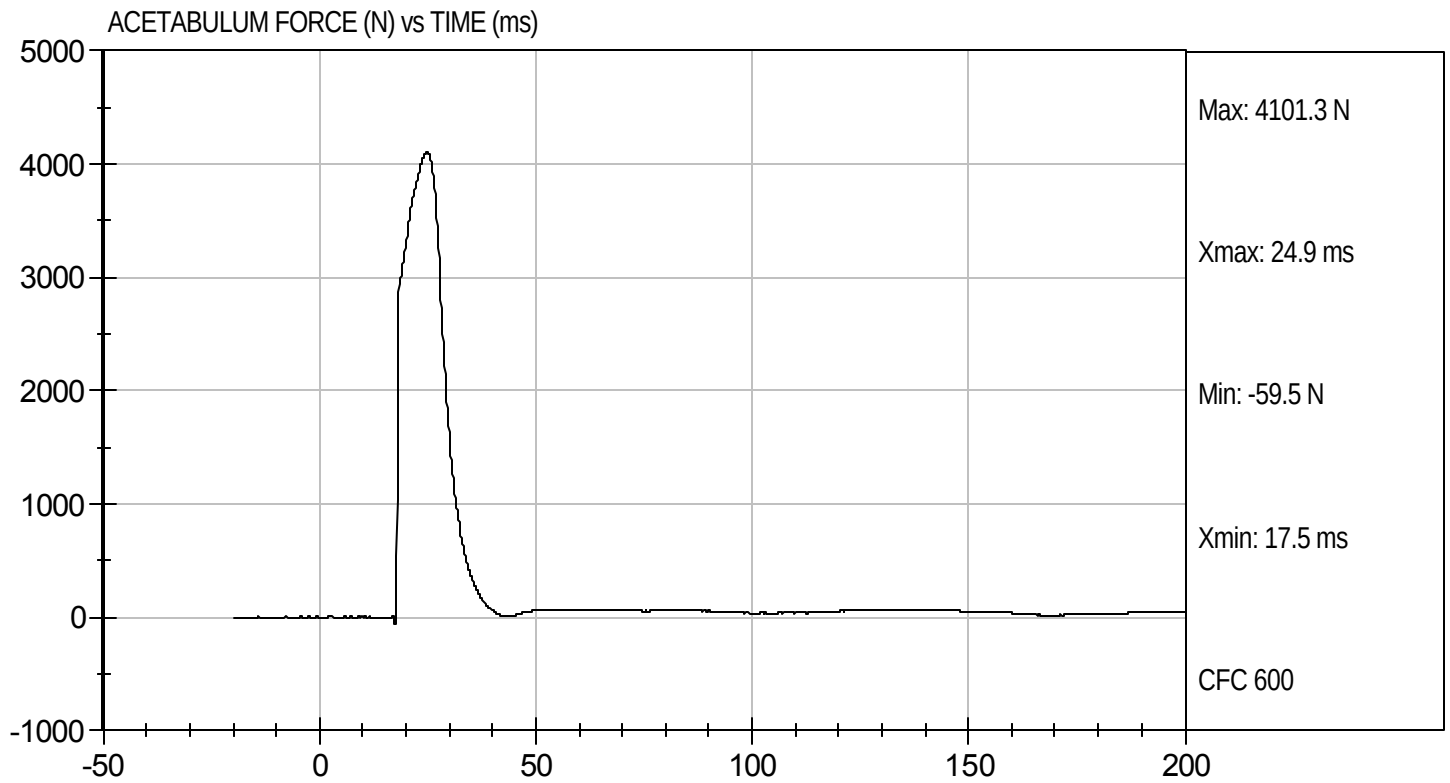
Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact  
Component ID: D09897

Test Date: 4/24/09  
Velocity: 22.22 ft/s, 6.77 m/s



**MGA RESEARCH CORPORATION**  
**ILIAC IMPACT TEST**  
**SID-II's BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D09898

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 21.5   | Pass      |
| Humidity                   | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.30   | Pass      |
| Peak Impactor Acceleration | G's   | 36 to 45      | 40     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 37     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 4800   | Pass      |
| Overall Test Results       |       |               |        | Pass      |

  
Laboratory Technician

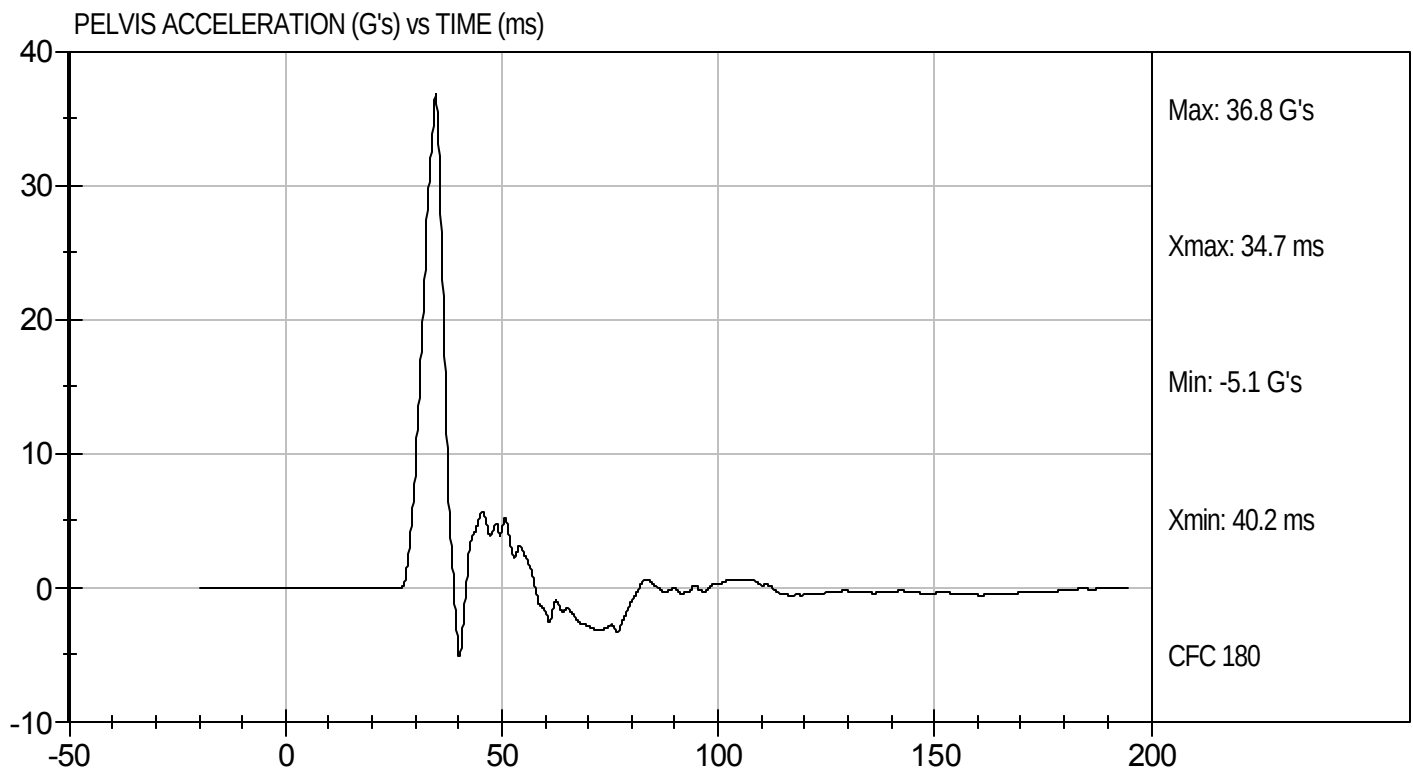
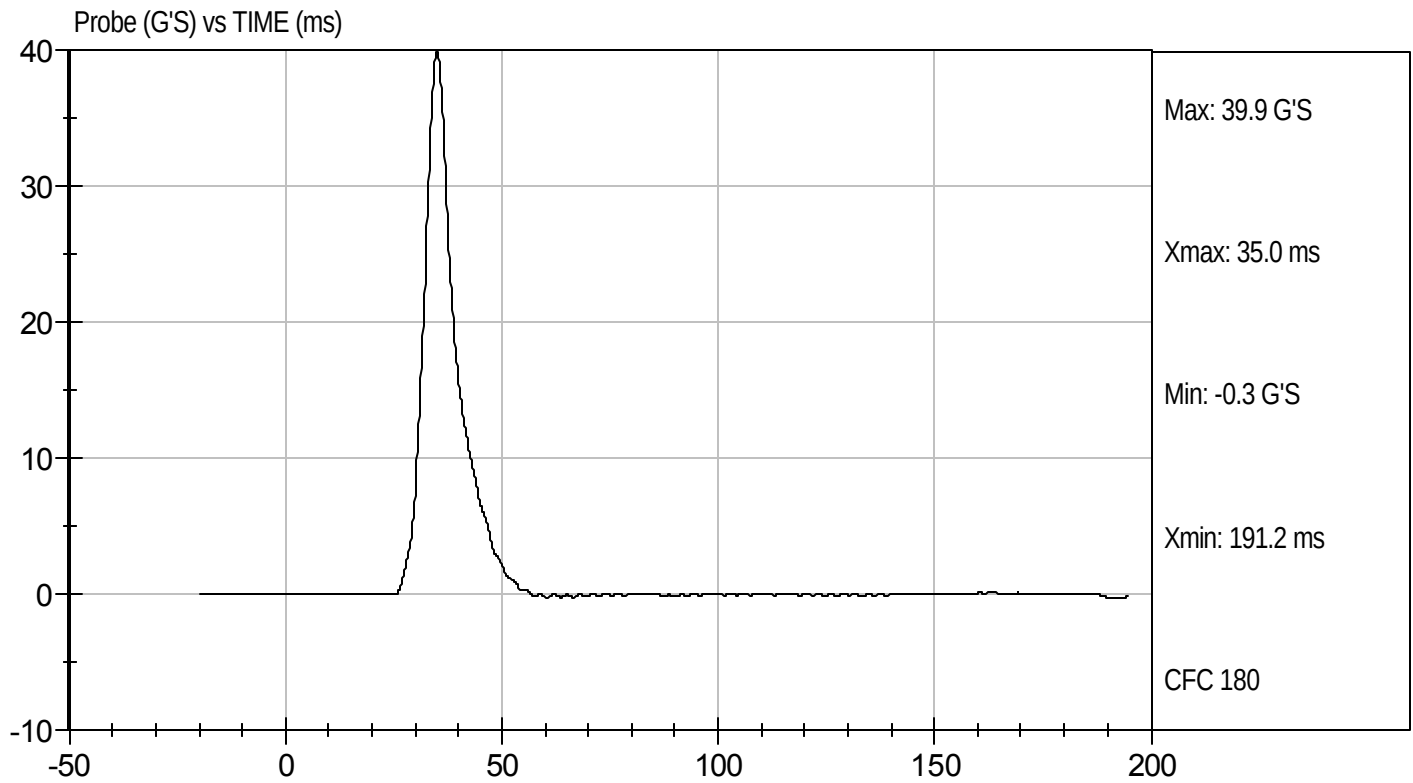
4/24/09  
Test Date

  
Approved By



Test Desc: Iliac Impact  
Component ID: D09898

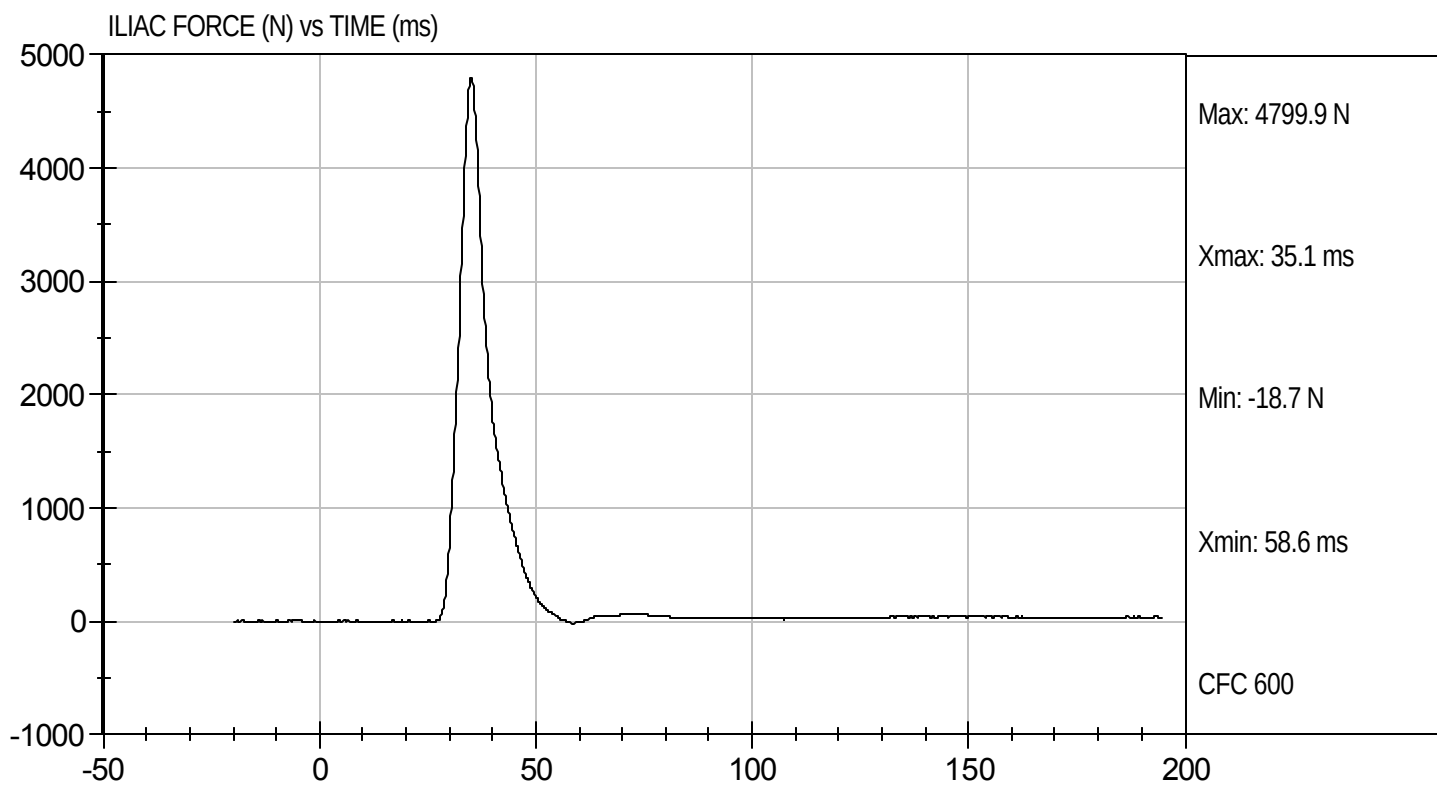
Test Date: 4/24/09  
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact  
Component ID: D09898

Test Date: 4/24/09  
Velocity: 14.12 ft/s, 4.30 m/s



**MGA RESEARCH CORPORATION**  
**HEAD DROP TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D091001

| Tested Parameter             | Units | Specification | Result | Pass/Fail |
|------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature       | deg C | 20.6 to 22.2  | 21.8   | Pass      |
| Laboratory Relative Humidity | %     | 10 to 70      | 46     | Pass      |
| Peak Resultant Acceleration  | G's   | 115 to 137    | 127    | Pass      |
| Peak Lateral Acceleration    | G's   | +/- 15        | 3.2    | Pass      |
| Unimodal                     | N/A   | <15%          | Yes    | Pass      |
| Overall Test Results         |       |               |        | Pass      |

  
Laboratory Technician

5/1/09  
Test Date

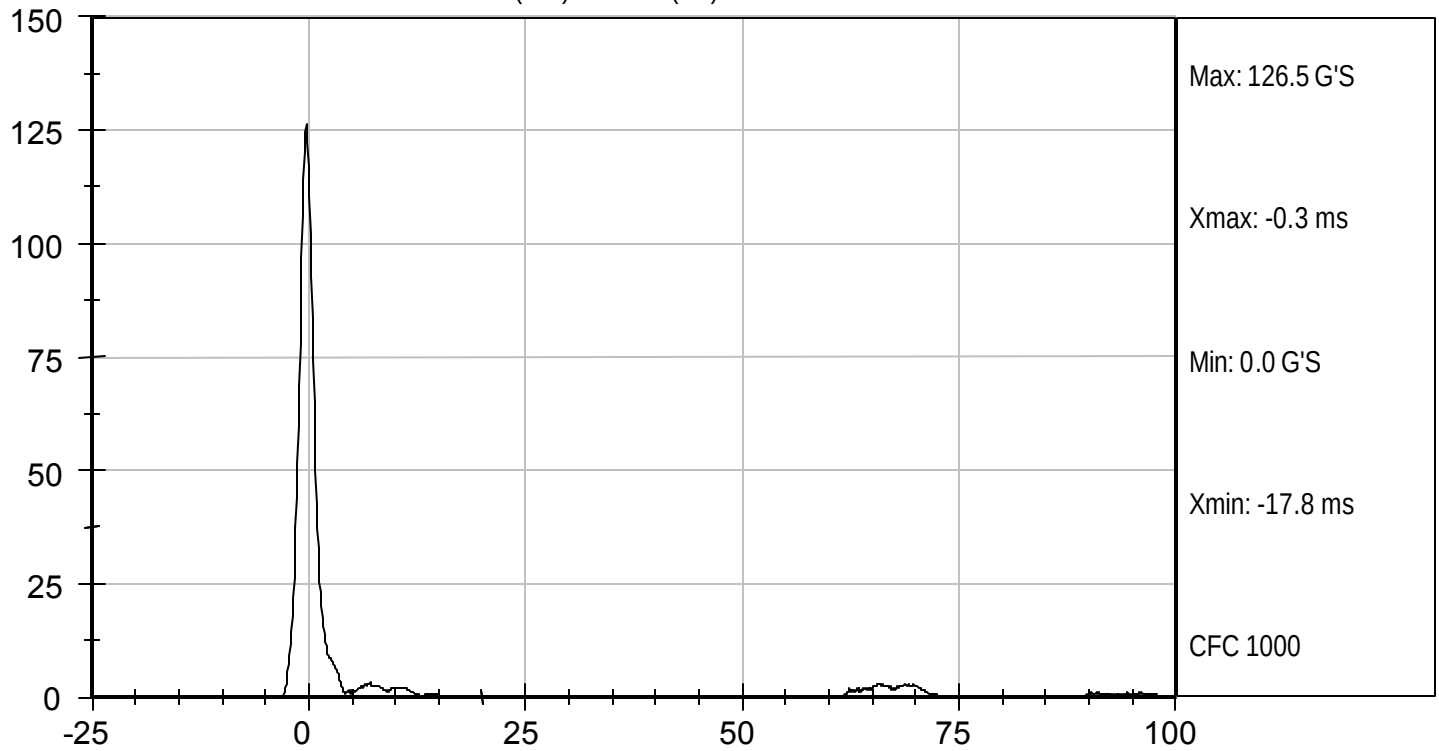
  
Approved By



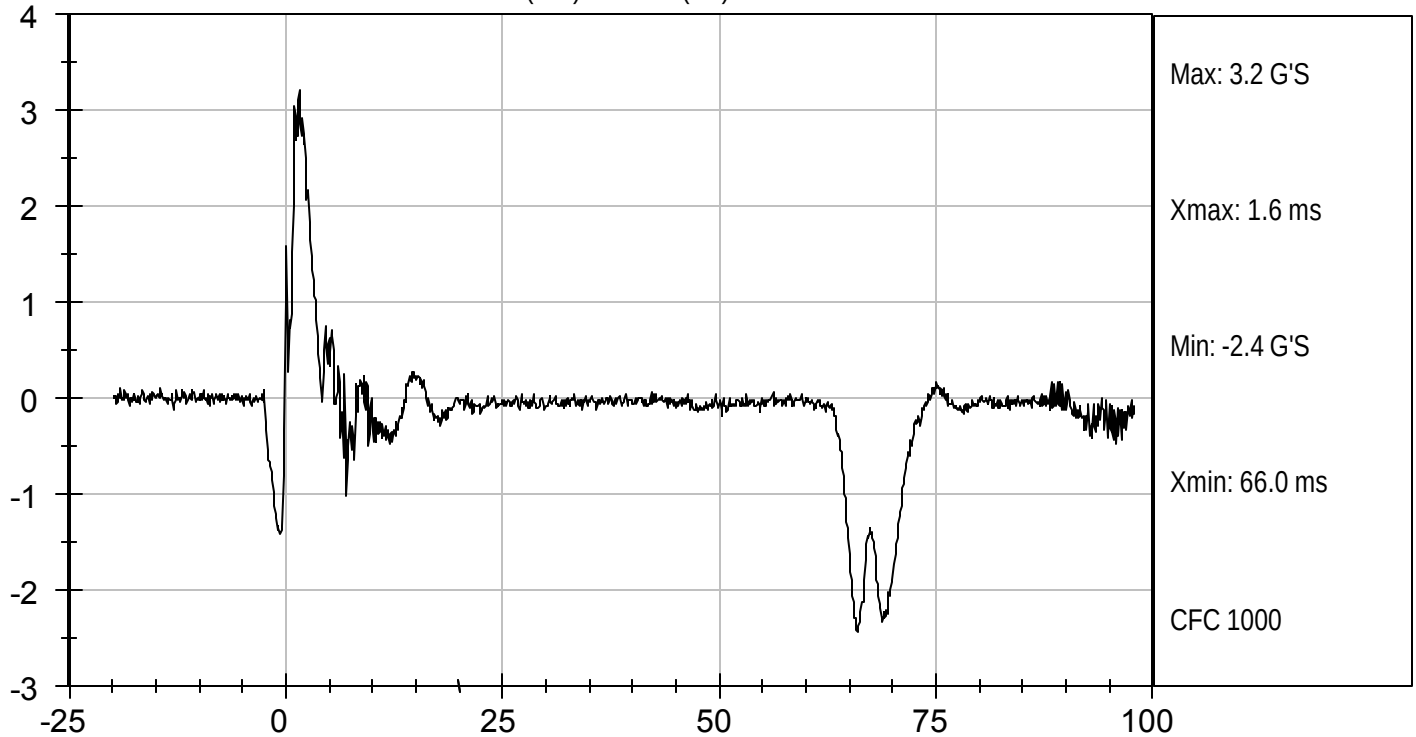
Test Desc: Head Drop  
Component ID: D091001

Test Date: 5/1/09  
Velocity: 0 ft/s, 0 m/s

PEAK RESULTANT ACCELERATION (G'S) vs TIME (ms)



PEAK LONGITUDINAL ACCELERATION (G'S) vs TIME (ms)

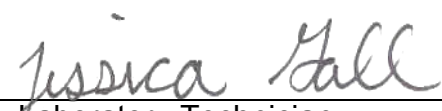


**MGA RESEARCH CORPORATION**  
**LATERAL NECK PENDULUM TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D091002

| Tested Parameter                                          |             | Units | Specification | Result | Pass/Fail |
|-----------------------------------------------------------|-------------|-------|---------------|--------|-----------|
| Temperature                                               |             | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                                                  |             | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                                           |             | m/s   | 5.51 to 5.63  | 5.52   | Pass      |
| Delta Velocity                                            | 10 msec     | m/s   | 2.20 to 2.80  | 2.62   | Pass      |
|                                                           | 15 msec     | m/s   | 3.30 to 4.10  | 3.67   | Pass      |
|                                                           | 20 msec     | m/s   | 4.40 to 5.40  | 4.83   | Pass      |
|                                                           | 25 msec     | m/s   | 5.40 to 6.10  | 5.63   | Pass      |
|                                                           | 25-100 msec | m/s   | 5.50 to 6.20  | 5.66   | Pass      |
| Maximum D-Plane Rotation                                  |             | deg   | 71 to 81      | 71     | Pass      |
| Time of Maximum D-Plane Rotation                          |             | msec  | 50 to 70      | 62     | Pass      |
| Maximum Occipital Condyle Moment during Rotation Interval |             | Nm    | -44 to -36    | -42.   | Pass      |
| Time of Moment Decay to 0 Nm                              |             | msec  | 102 to 126    | 114    | Pass      |
| Overall Test Results                                      |             |       |               |        | Pass      |

  
 Laboratory Technician

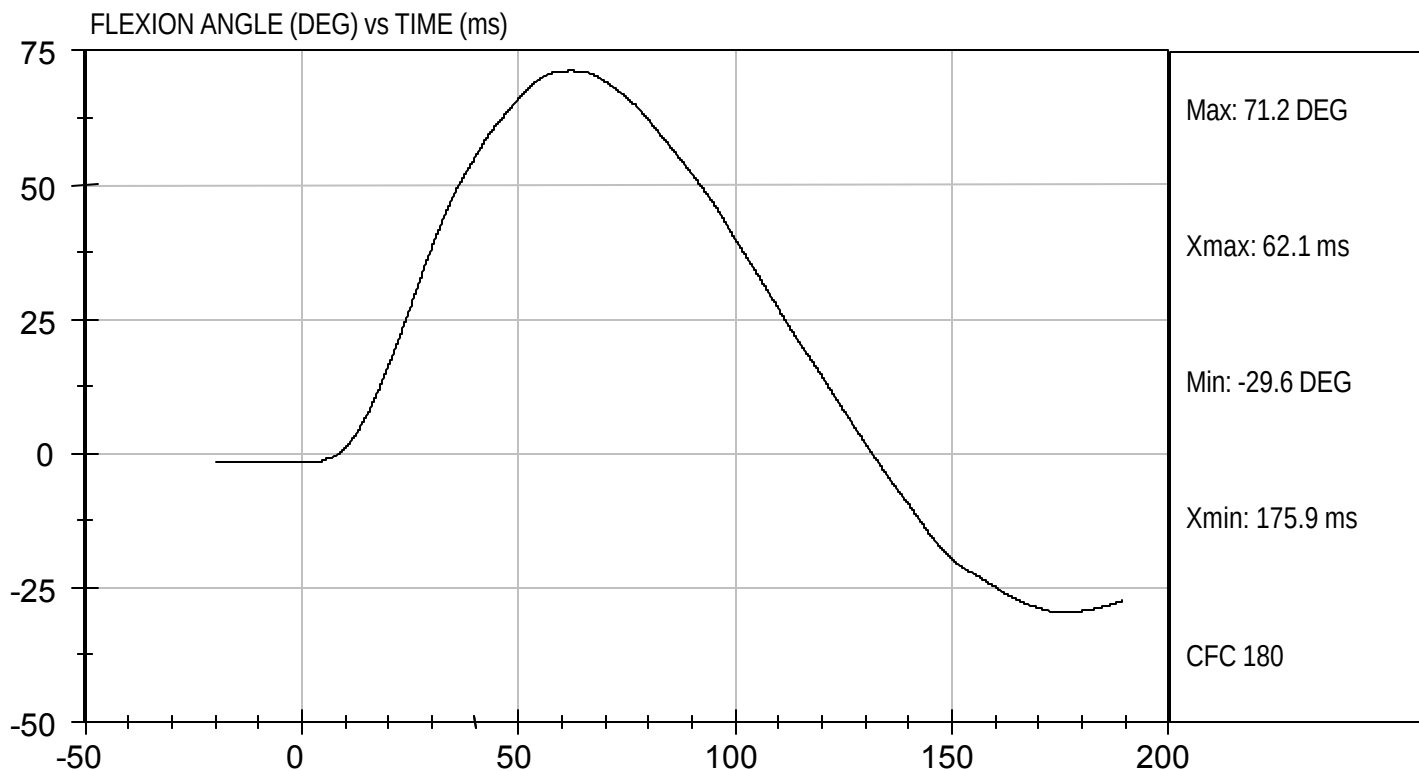
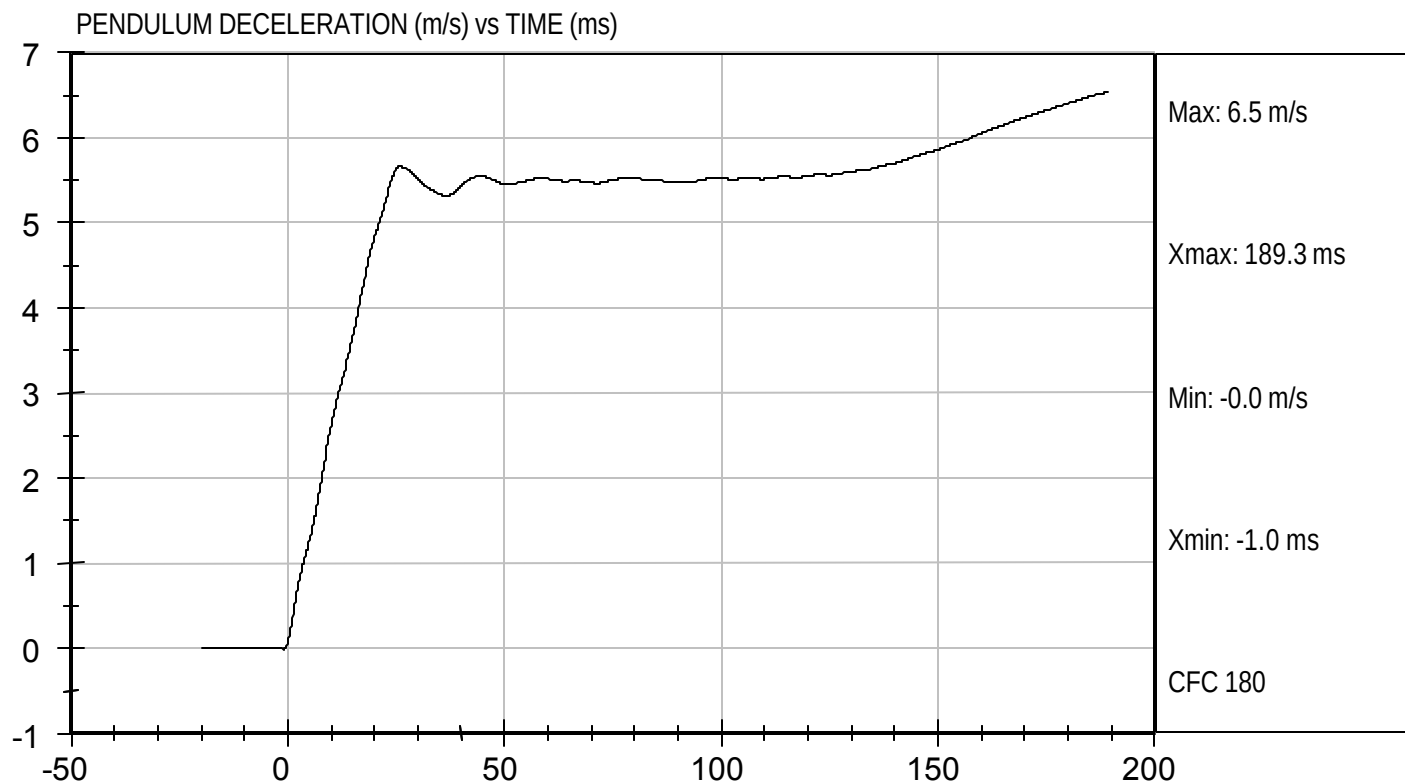
5/1/09  
 Test Date

  
 Approved By



Test Desc: Neck Bending  
Component ID: D091002

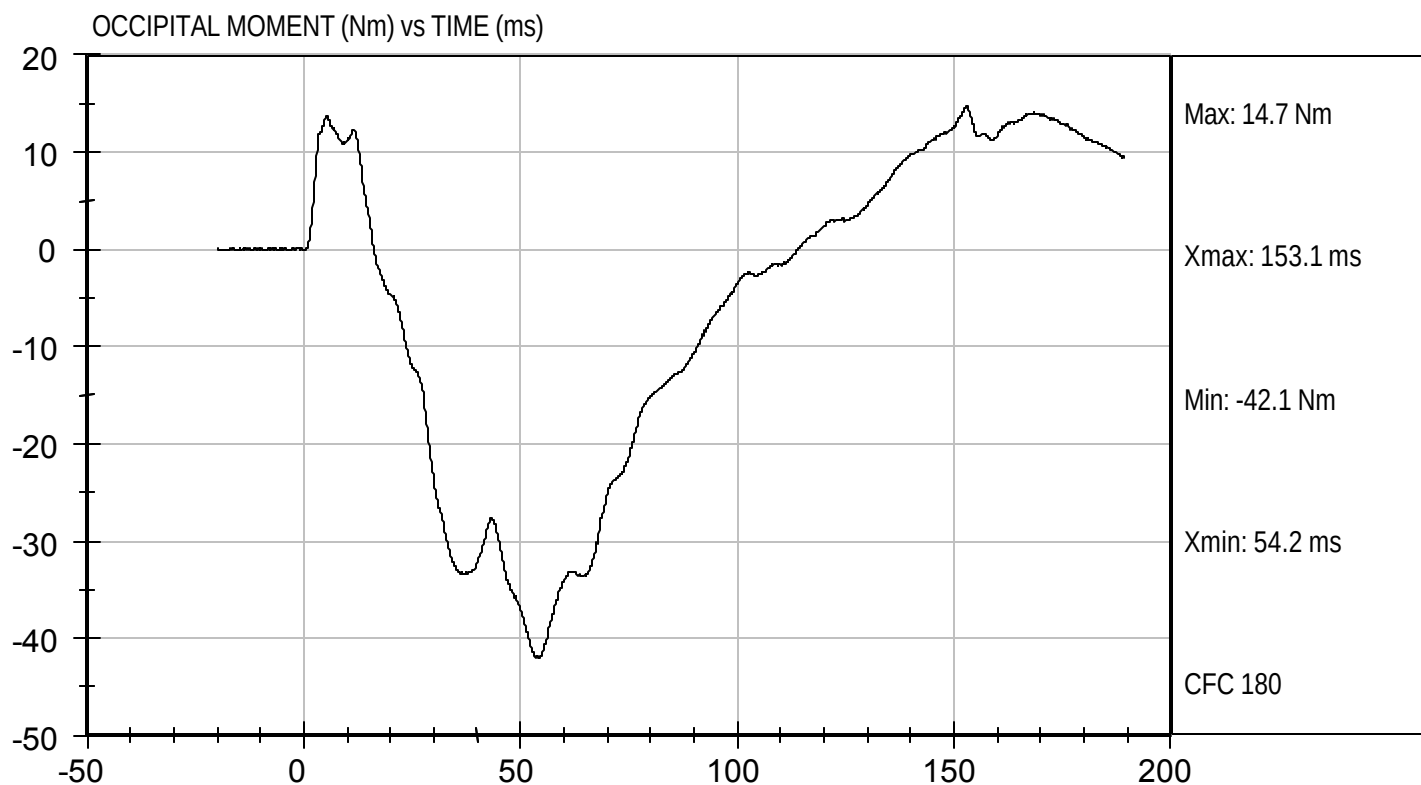
Test Date: 5/1/09  
Velocity: 18.1 ft/s, 5.52 m/s





Test Desc: Neck Bending  
Component ID: D091002

Test Date: 5/1/09  
Velocity: 18.1 ft/s, 5.52 m/s

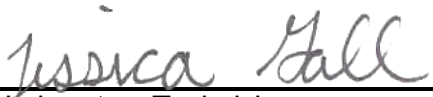


**MGA RESEARCH CORPORATION**  
**SHOULDER IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test ID:** D091003

| Tested Parameter                | Units | Specification | Result | Pass/Fail |
|---------------------------------|-------|---------------|--------|-----------|
| Laboratory Temperature          | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Laboratory Relative Humidity    | %     | 10 to 70      | 50     | Pass      |
| Impact Velocity                 | m/s   | 4.20 to 4.40  | 4.39   | Pass      |
| Maximum Probe Acceleration      | G's   | 13 to 18      | 16     | Pass      |
| Shoulder Displacement           | mm    | 28 to 37      | 32     | Pass      |
| Upper Spine (T1) Y Acceleration | G's   | 17 to 22      | 19     | Pass      |
| Overall Test Results            |       |               |        | Pass      |

  
Laboratory Technician

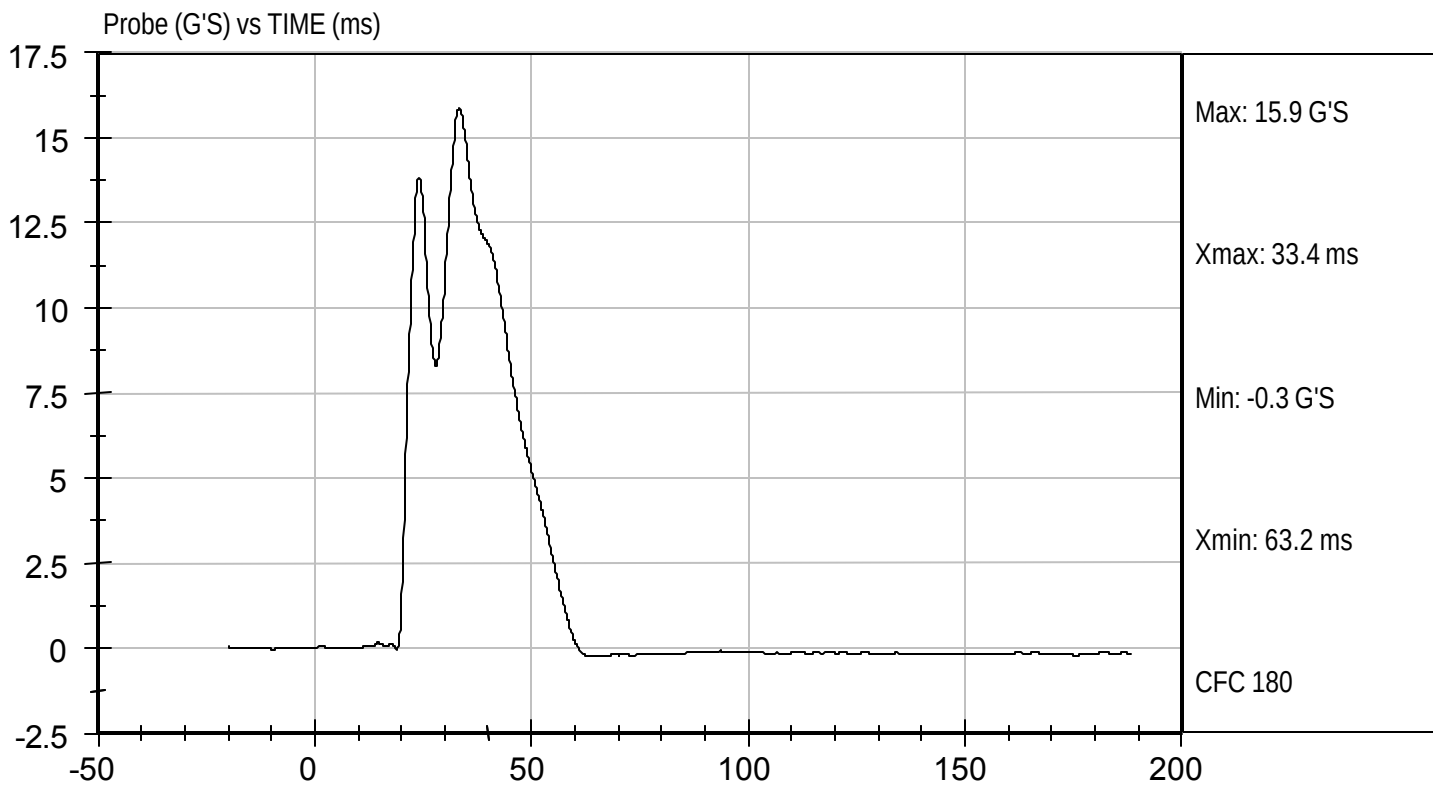
4/30/09  
Test Date

  
Approved By



Test Desc: Shoulder Impact  
Component ID: D091003

Test Date: 4/30/09  
Velocity: 14.4 ft/s, 4.39 m/s

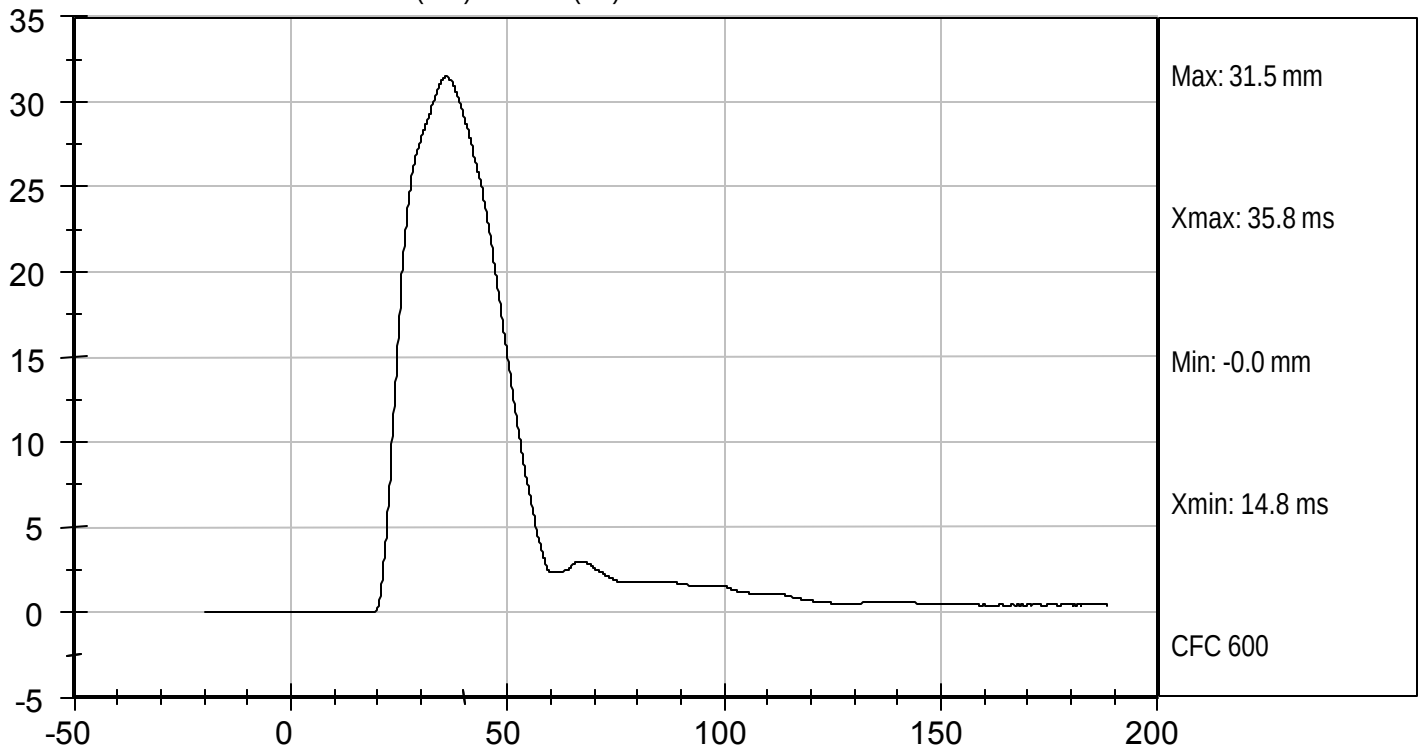




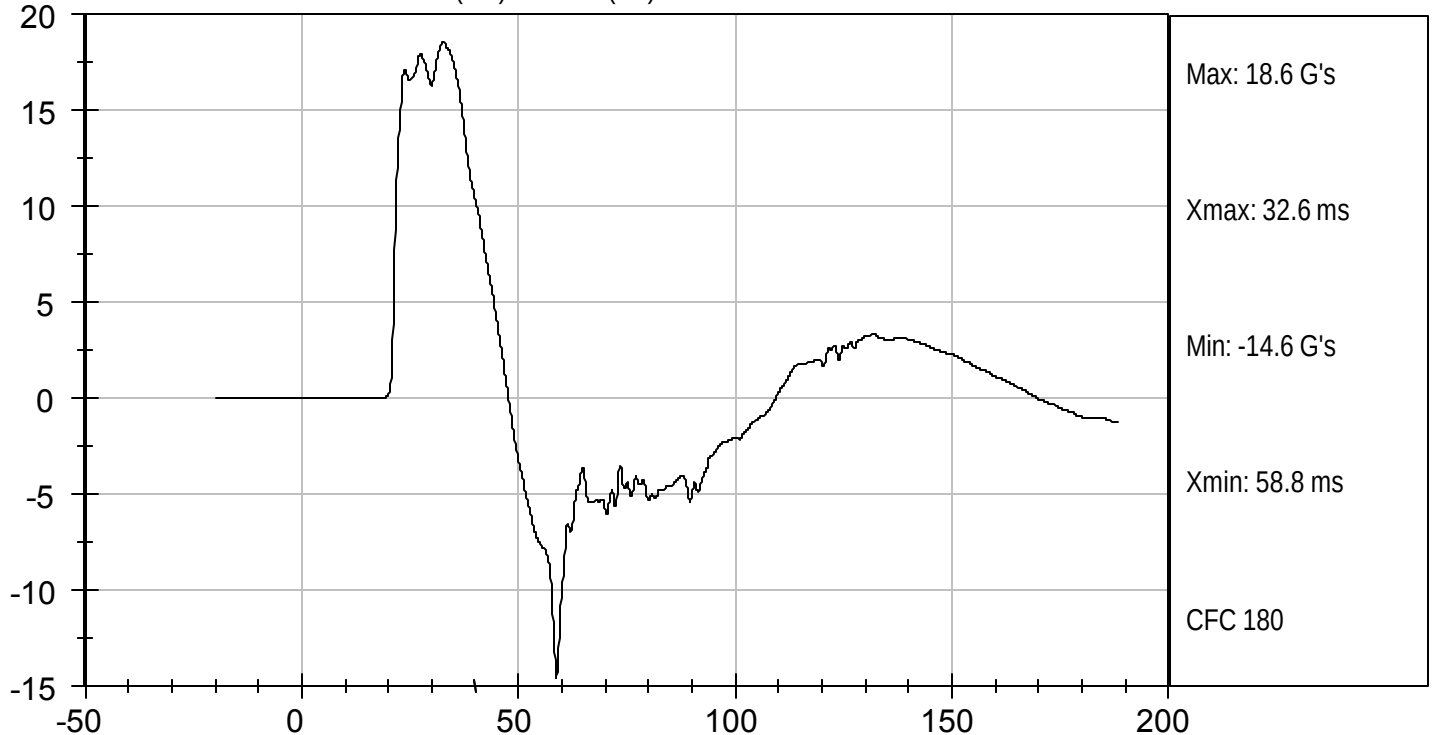
Test Desc: Shoulder Impact  
Component ID: D091003

Test Date: 4/30/09  
Velocity: 14.4 ft/s, 4.39 m/s

SHOULDER DISPLACEMENT (mm) vs TIME (ms)



UPPER SPINE ACCELERATION (G's) vs TIME (ms)



**MGA RESEARCH CORPORATION**  
**THORAX (WITH ARM) IMPACT TEST**  
**SID-ILs BUILD LEVEL D DUMMY**

ATD Serial No: 296

Test I.D: D091004

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Humidity                         | %     | 10 to 70      | 47     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.68   | Pass      |
| Peak Impactor Acceleration       | G's   | 30 to 36      | 34     | Pass      |
| Shoulder Displacement            | mm    | 31 to 40      | 35     | Pass      |
| Upper Rib Displacement           | mm    | 25 to 32      | 27     | Pass      |
| Middle Rib Displacement          | mm    | 30 to 36      | 31     | Pass      |
| Lower Rib Displacement           | mm    | 32 to 38      | 34     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 34 to 43      | 37     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 29 to 37      | 35     | Pass      |
| Overall Test Results             |       |               | Pass   |           |

Jessica Hall  
Laboratory Technician

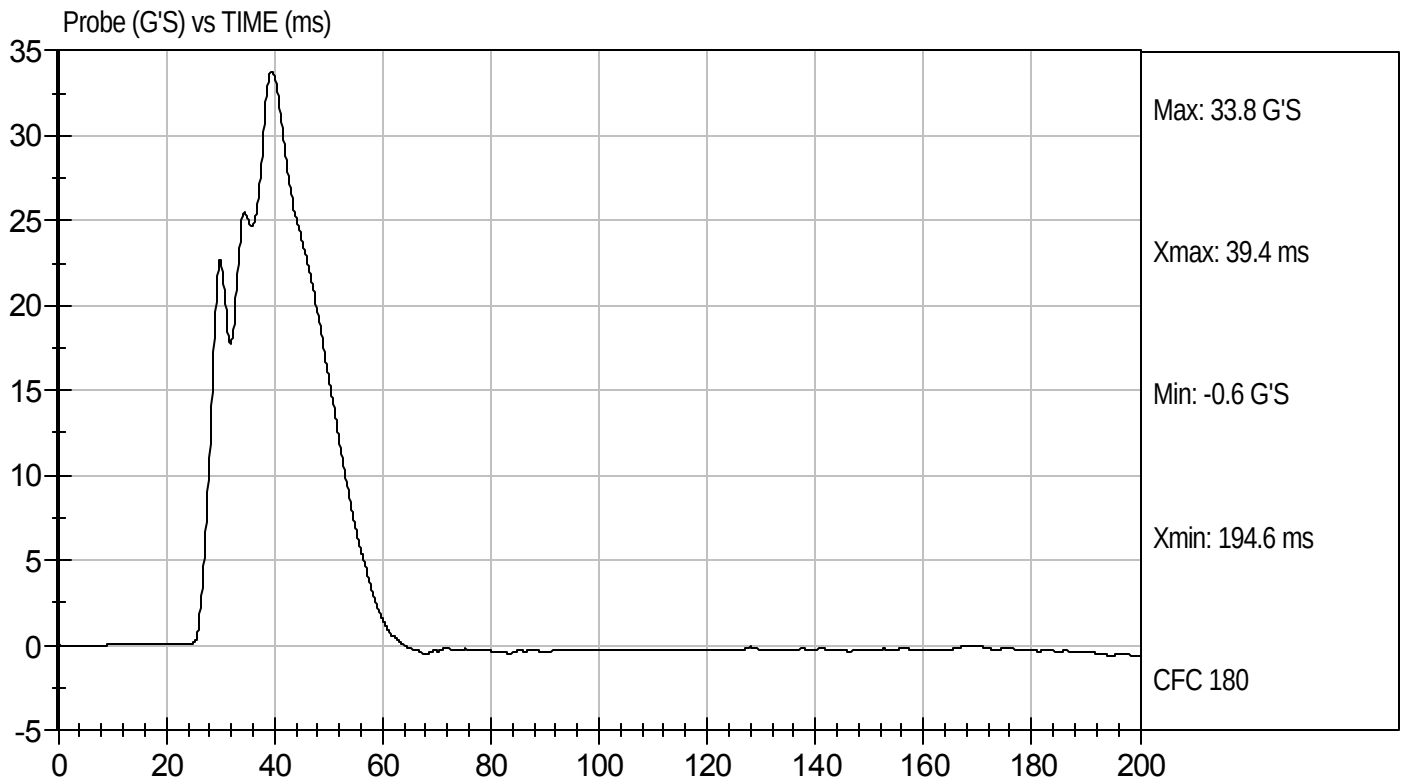
4/30/09  
Test Date

David Winkelbauer  
Approved By



Test Desc: Thorax With Arm  
Component ID: D091004

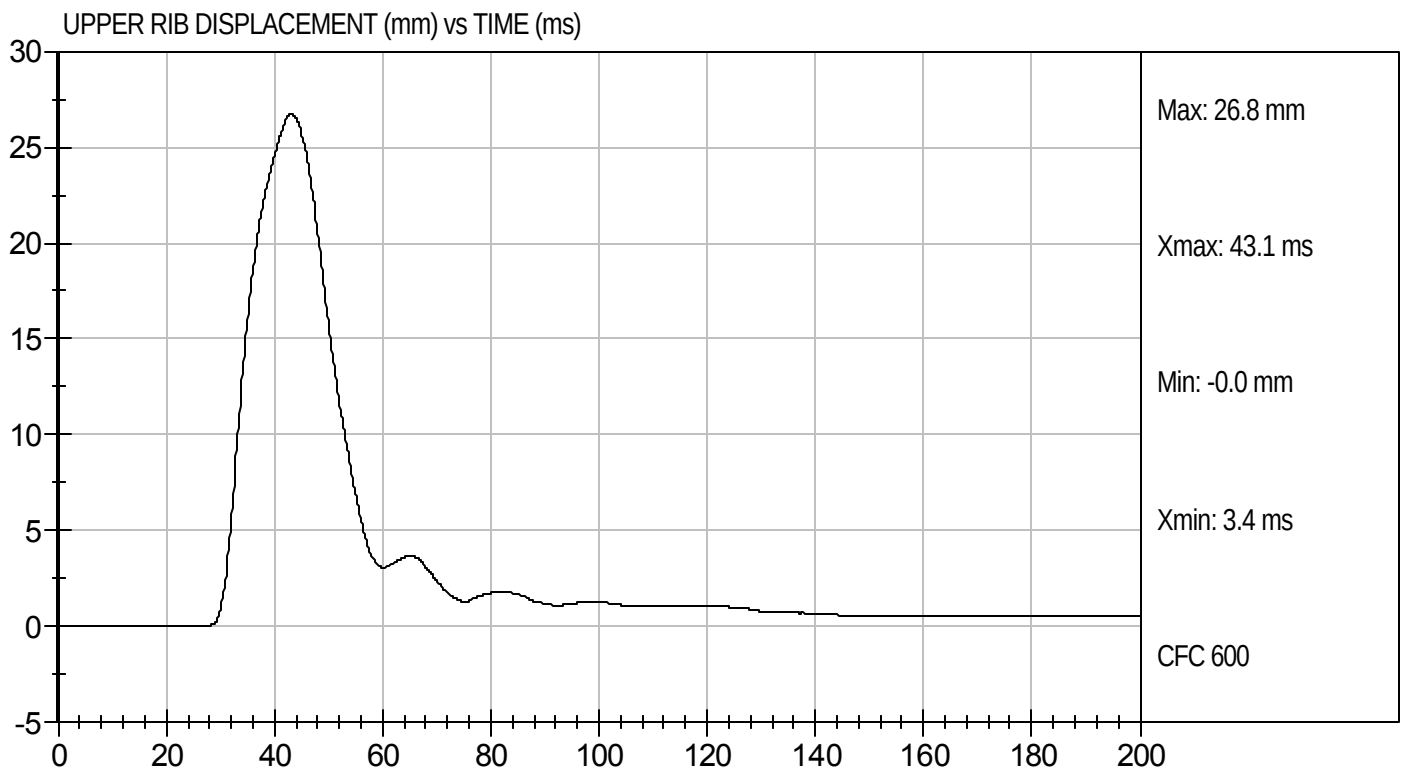
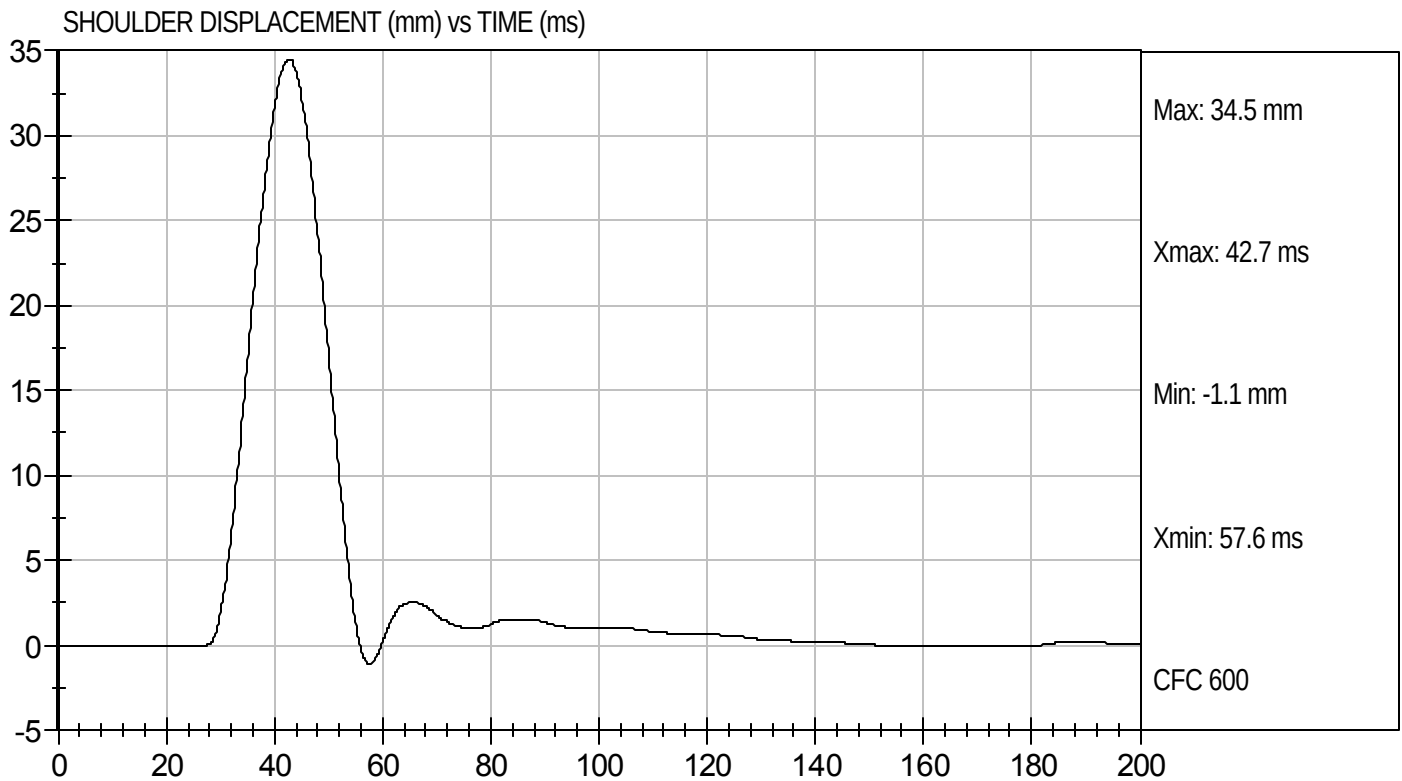
Test Date: 4/30/09  
Velocity: 21.92 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D091004

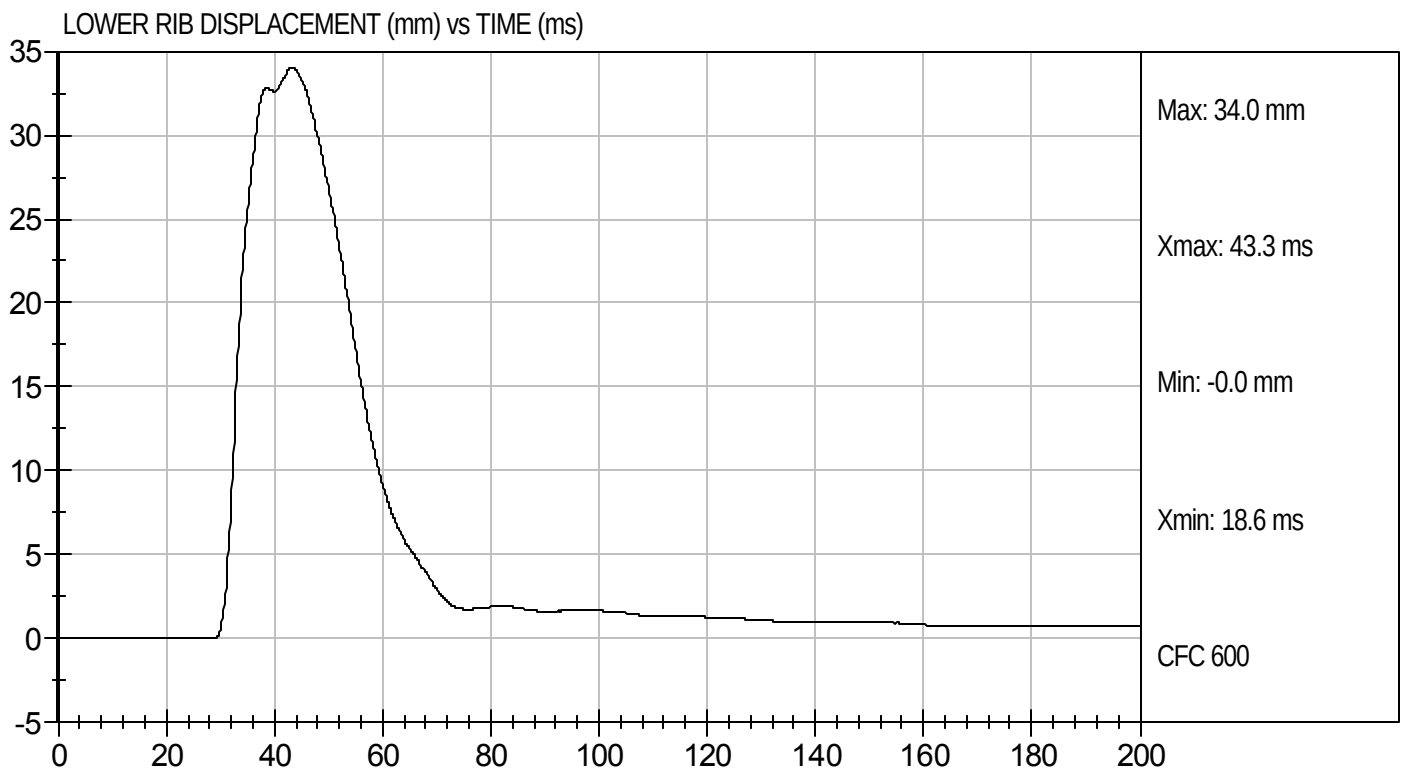
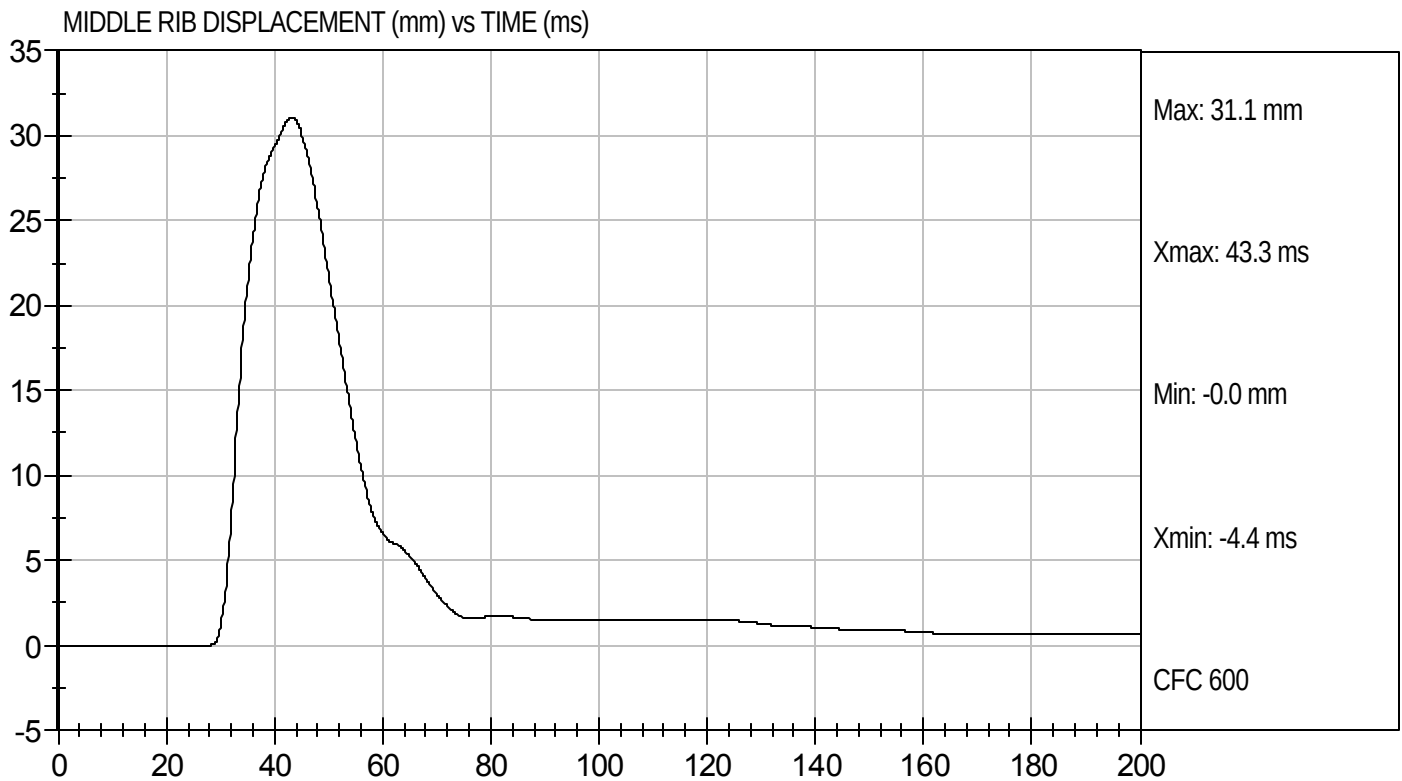
Test Date: 4/30/09  
Velocity: 21.92 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D091004

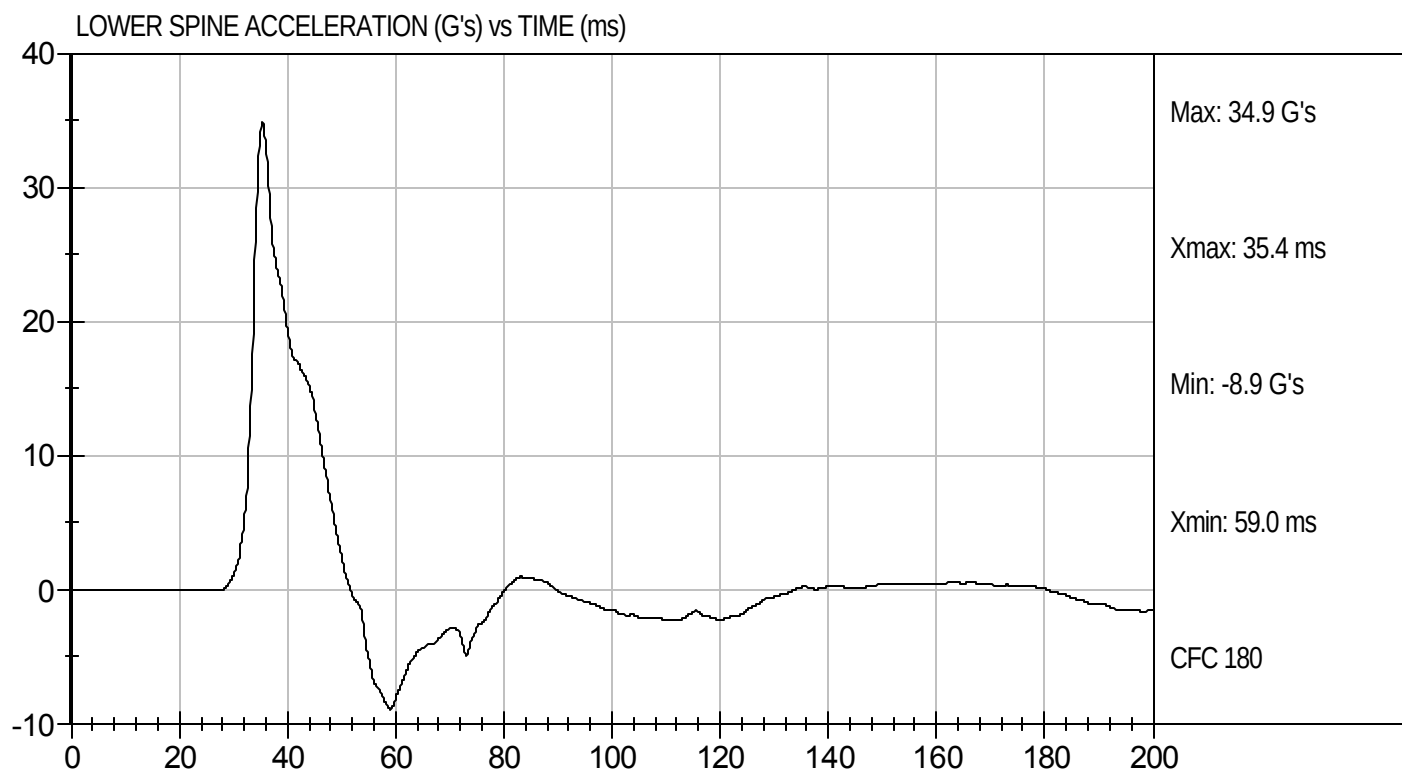
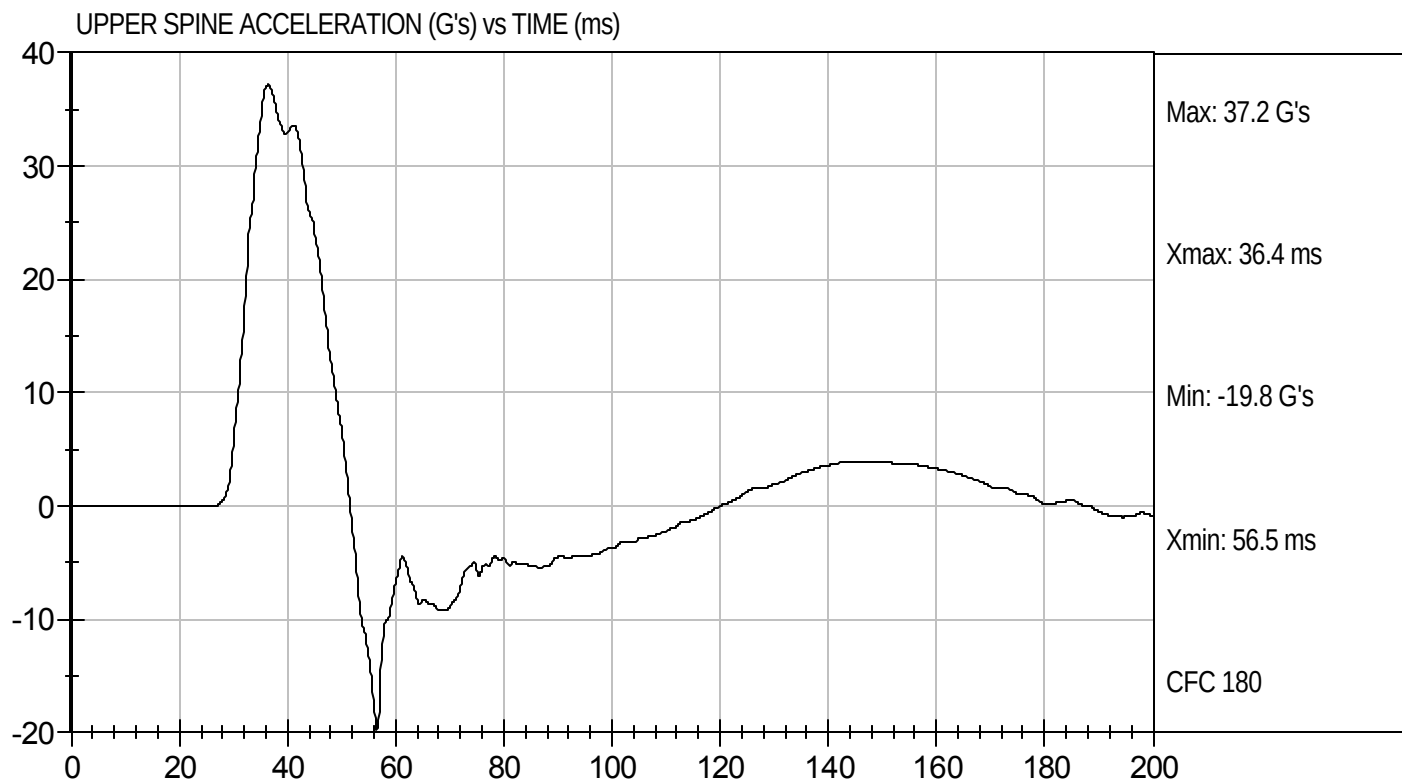
Test Date: 4/30/09  
Velocity: 21.92 ft/s, 6.68 m/s





Test Desc: Thorax With Arm  
Component ID: D091004

Test Date: 4/30/09  
Velocity: 21.92 ft/s, 6.68 m/s



**MGA RESEARCH CORPORATION**  
**THORAX (WITHOUT ARM) IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D091005

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.3   | Pass      |
| Humidity                         | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.30   | Pass      |
| Peak Impactor Force              | G's   | 14 to 18      | 15     | Pass      |
| Upper Rib Displacement           | mm    | 32 to 40      | 38     | Pass      |
| Middle Rib Displacement          | mm    | 39 to 45      | 42     | Pass      |
| Lower Rib Displacement           | mm    | 35 to 43      | 39     | Pass      |
| Upper Spine (T1) Y Acceleration  | G's   | 13 to 17      | 15     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 7 to 11       | 9      | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

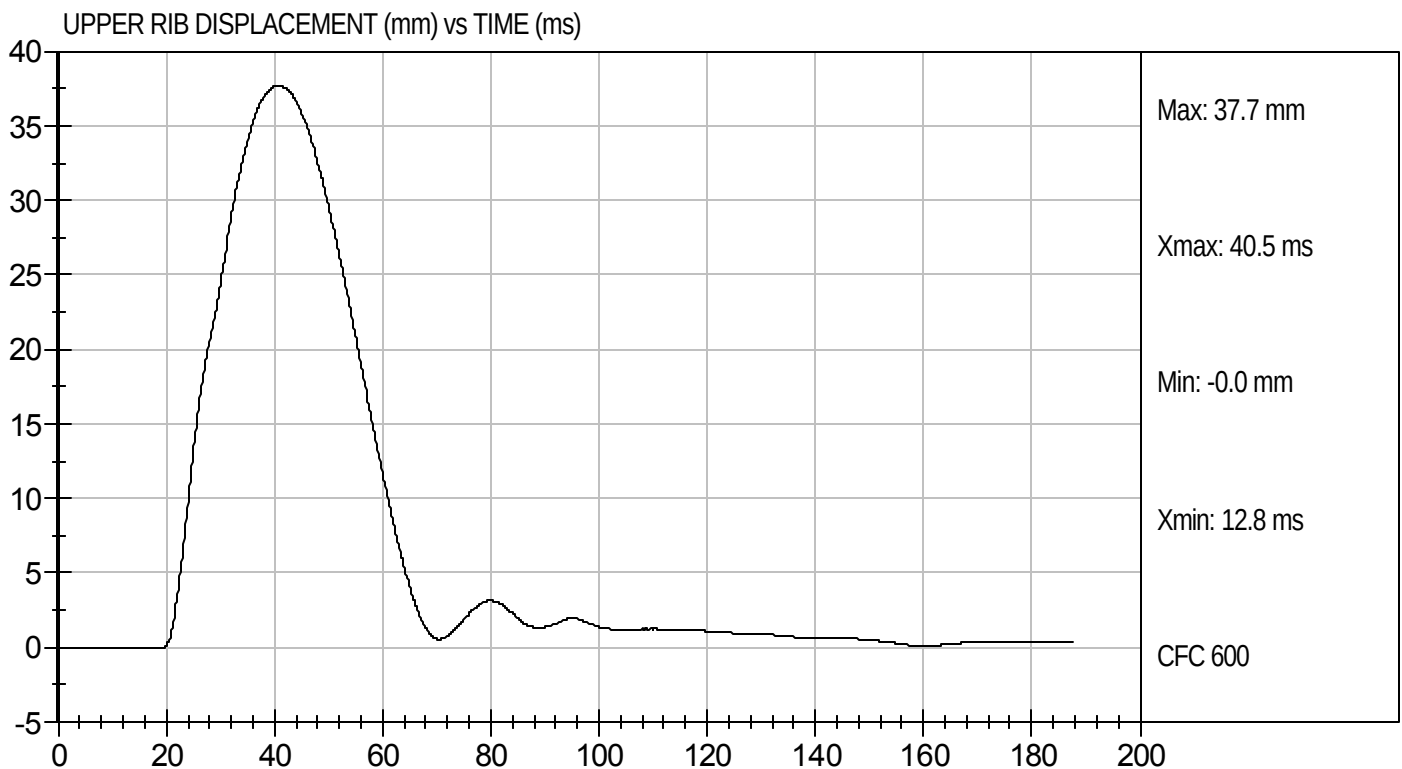
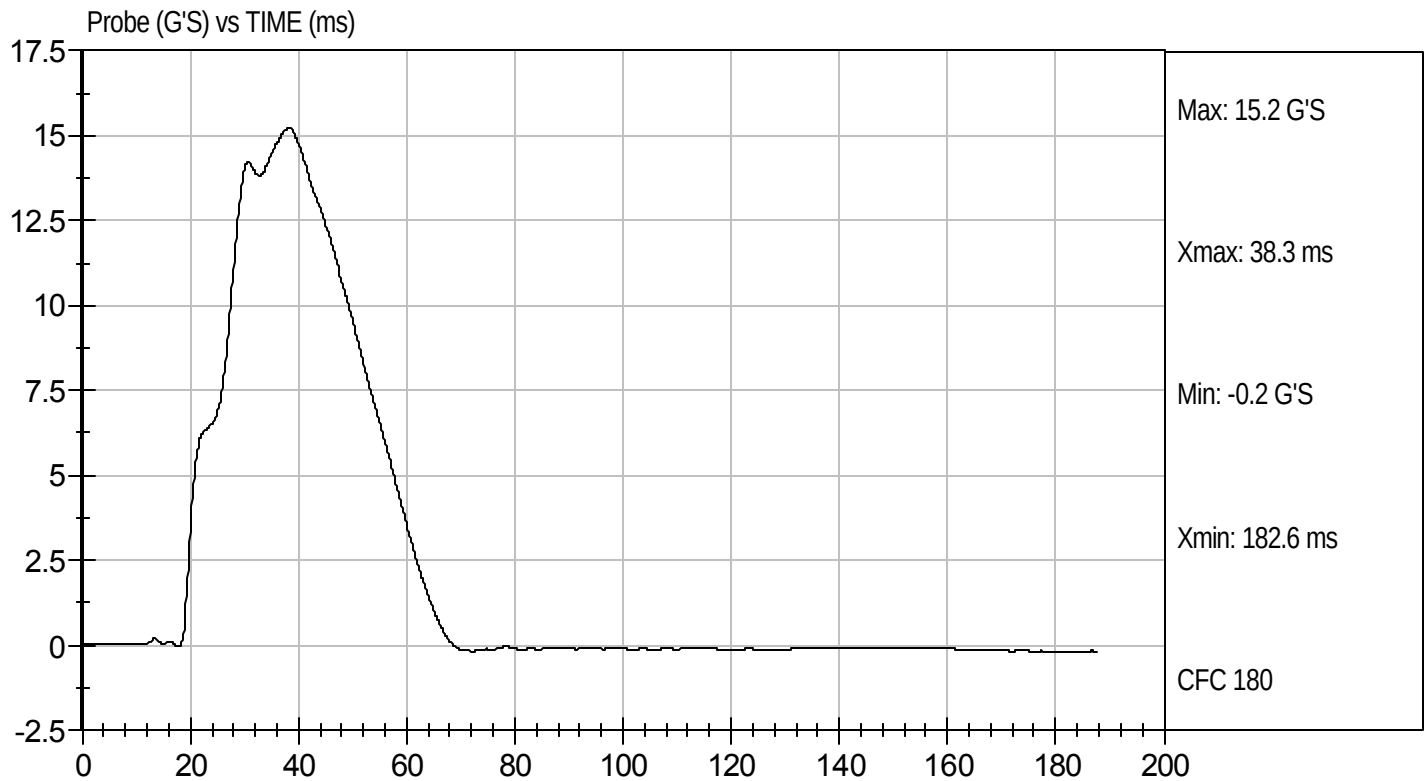
4/30/09  
Test Date

  
Approved By



Test Desc: Thorax Without Arm  
Component ID: D091005

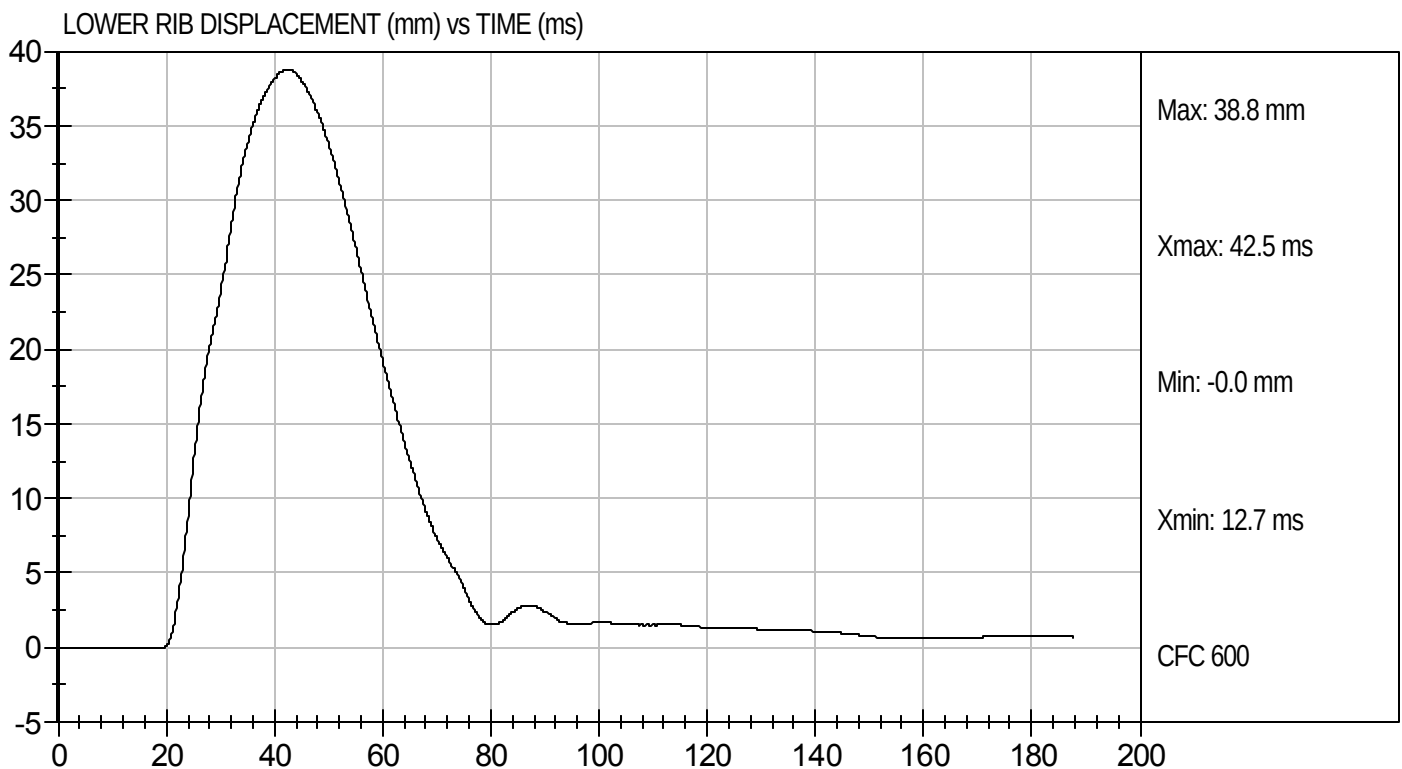
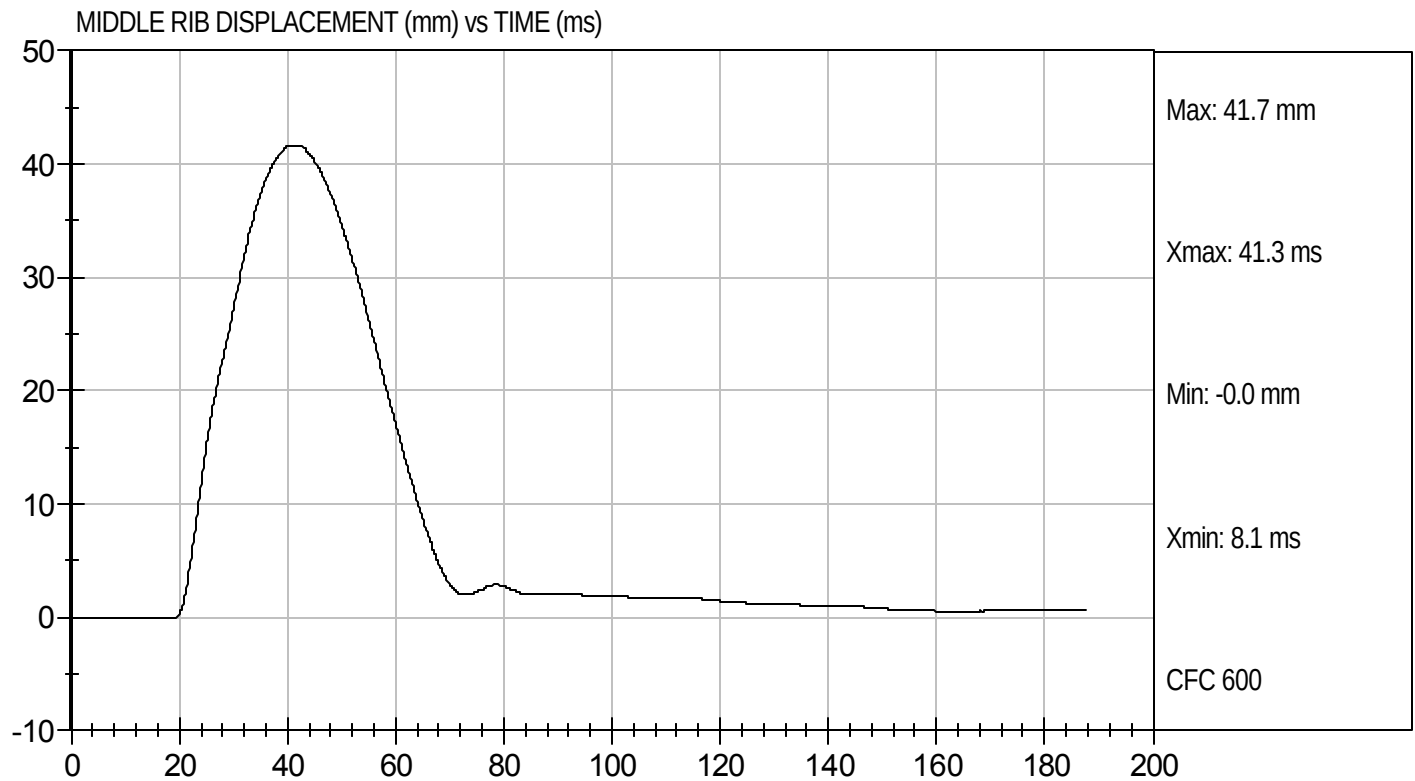
Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm  
Component ID: D091005

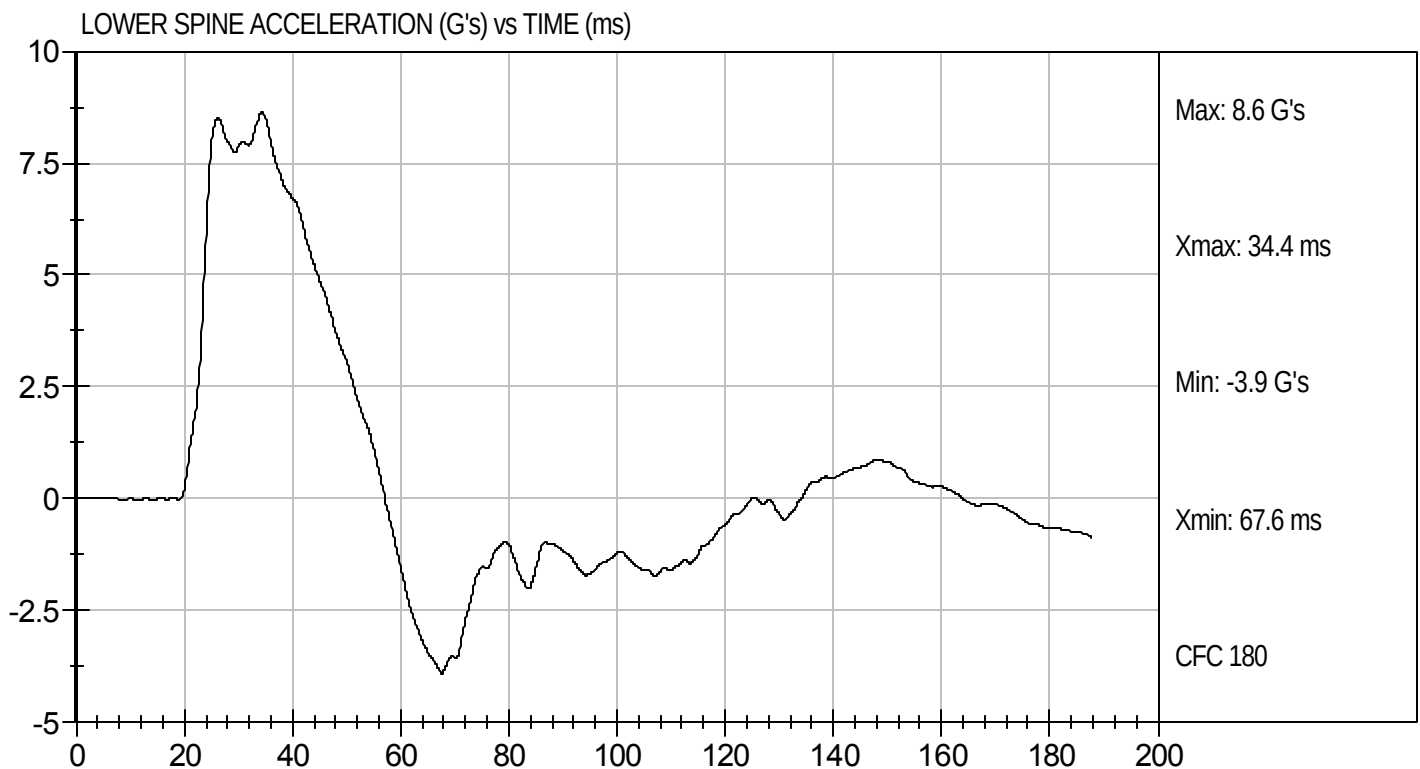
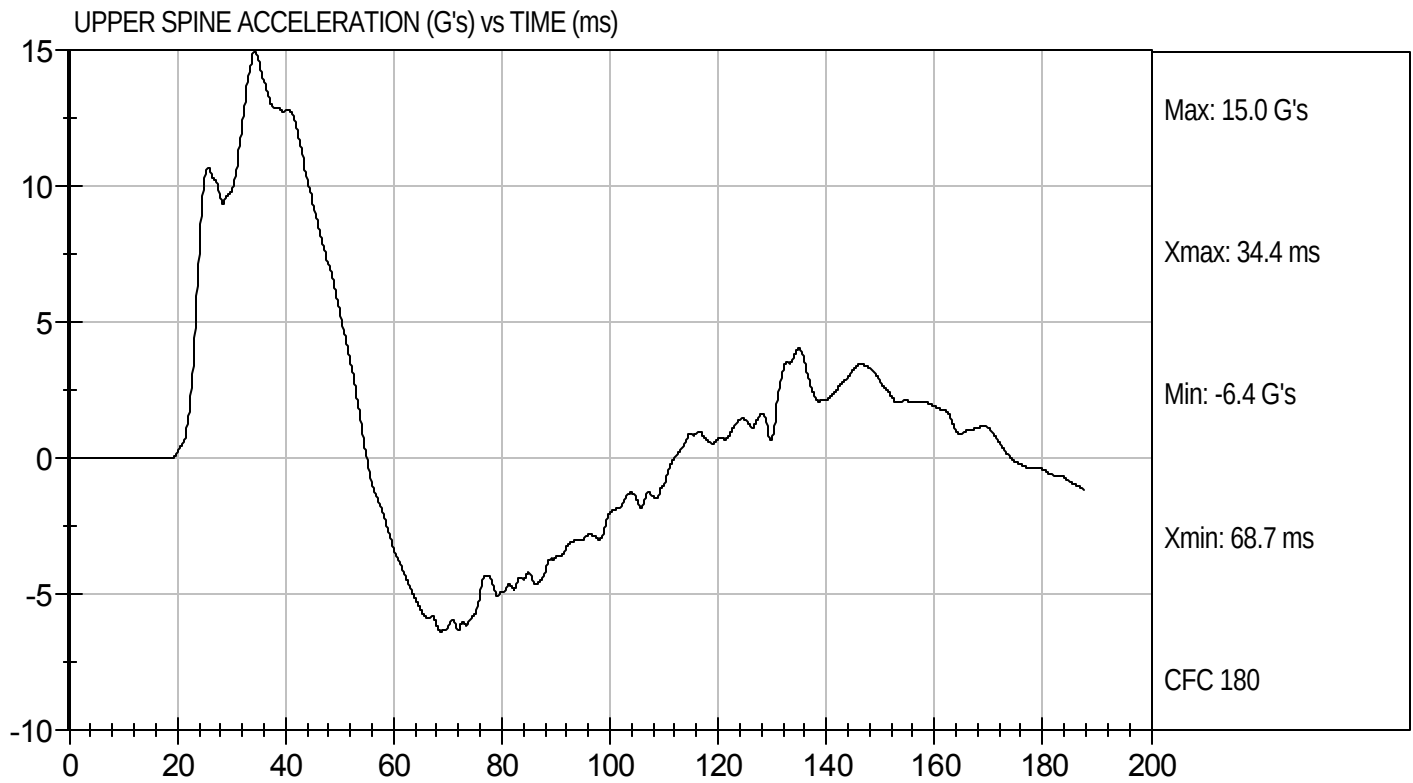
Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Thorax Without Arm  
Component ID: D091005

Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.30 m/s

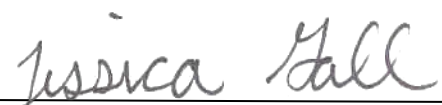


**MGA RESEARCH CORPORATION**  
**ABDOMINAL IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D091006

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Humidity                         | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                  | m/s   | 4.20 to 4.40  | 4.30   | Pass      |
| Peak Impactor Acceleration       | G's   | 12 to 16      | 15     | Pass      |
| Upper Rib Displacement           | mm    | 36 to 47      | 41     | Pass      |
| Lower Rib Displacement           | mm    | 33 to 44      | 41     | Pass      |
| Lower Spine (T12) Y Acceleration | G's   | 9 to 14       | 12     | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

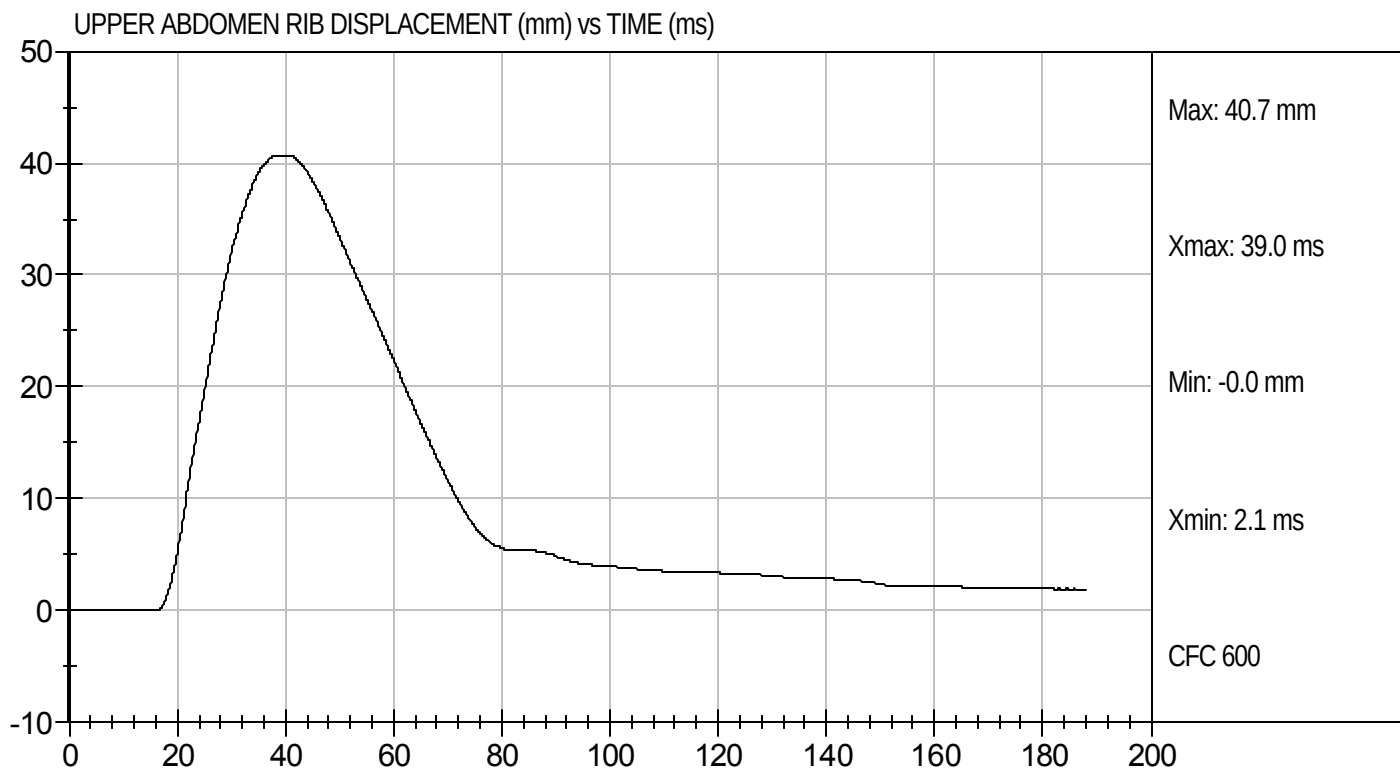
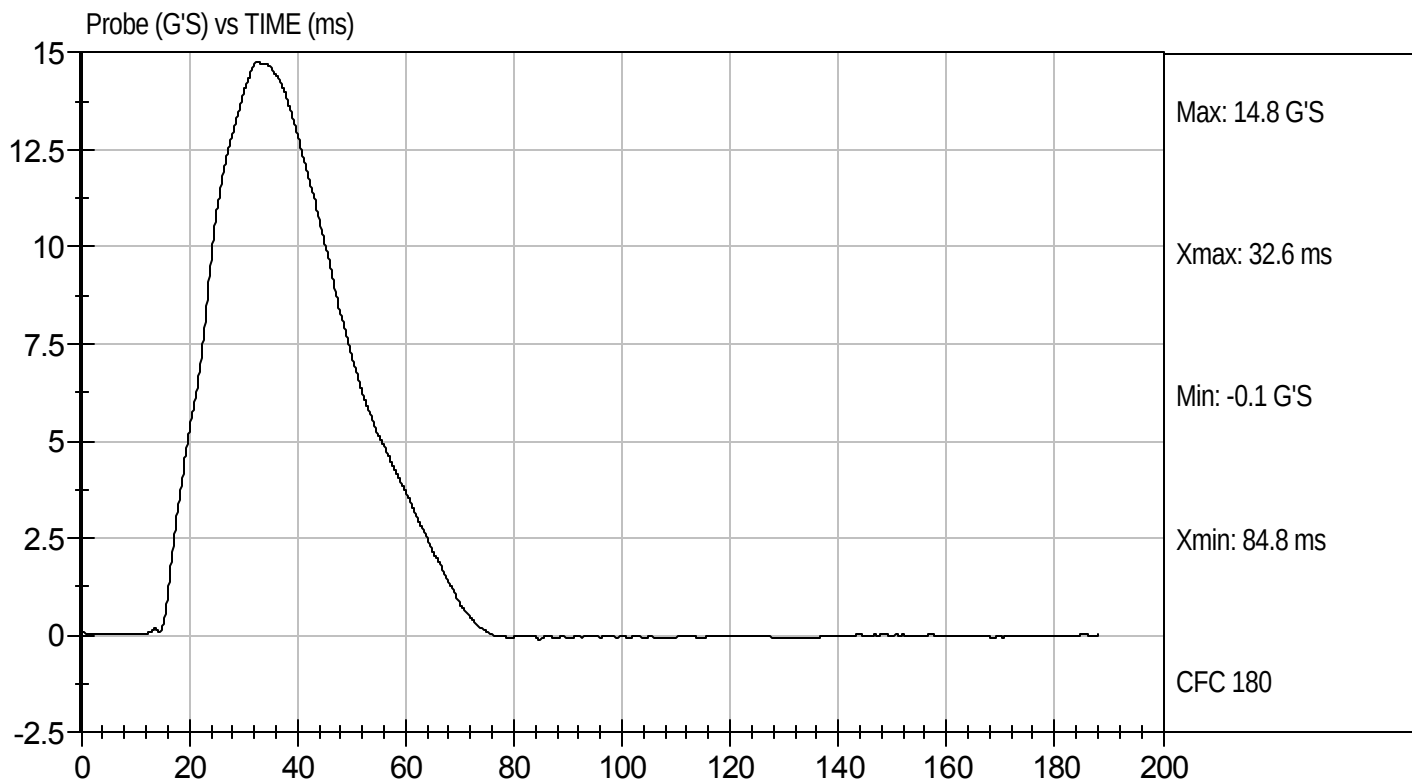
4/30/09  
Test Date

  
Approved By



Test Desc: Abdomen Impact  
Component ID: D091006

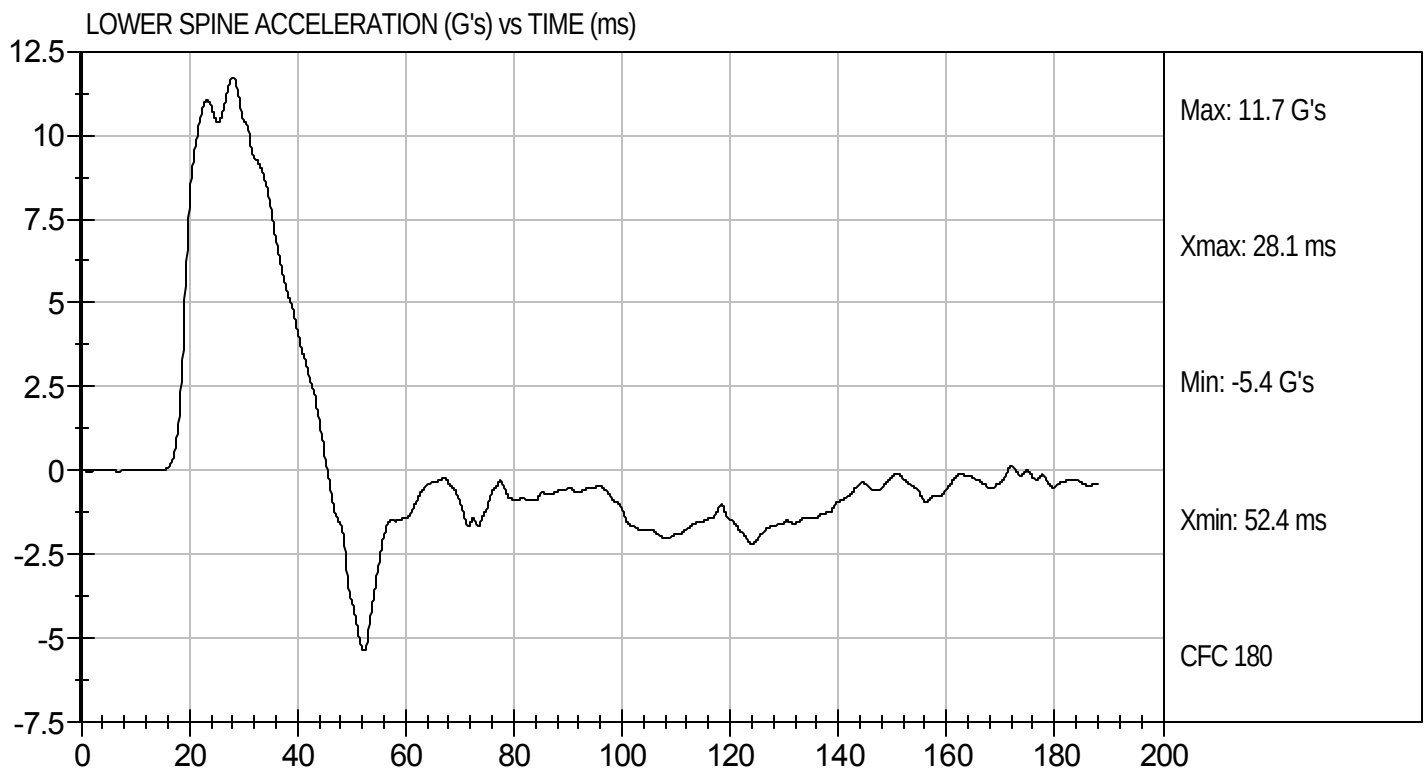
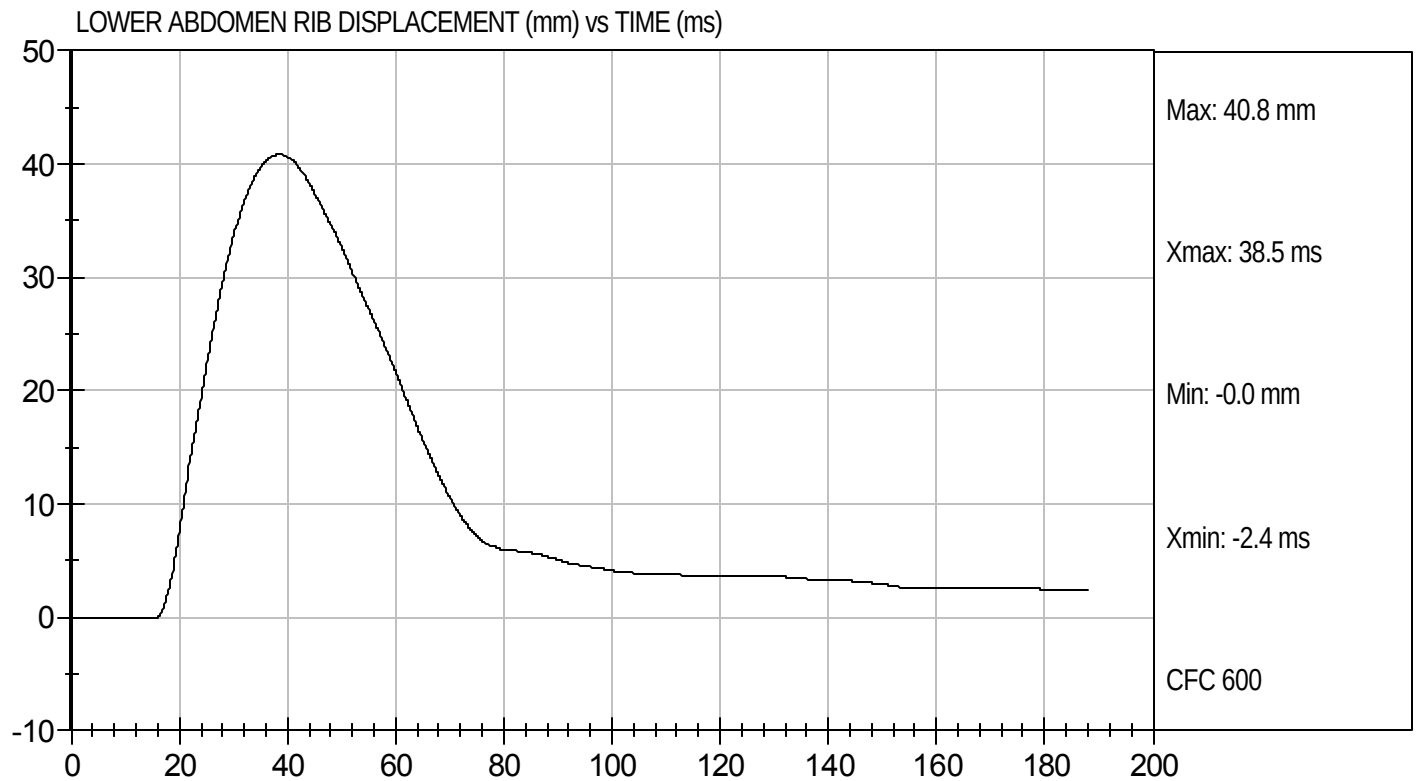
Test Date: 4/30/09  
Velocity: 14.1 ft/s, 4.30 m/s





Test Desc: Abdomen Impact  
Component ID: D091006

Test Date: 4/30/09  
Velocity: 14.1 ft/s, 4.30 m/s

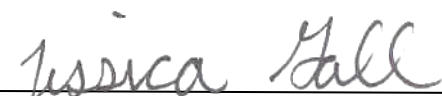


**MGA RESEARCH CORPORATION**  
**PELVIS IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D091007

| Tested Parameter                 | Units | Specification | Result | Pass/Fail |
|----------------------------------|-------|---------------|--------|-----------|
| Temperature                      | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Humidity                         | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity                  | m/s   | 6.60 to 6.80  | 6.77   | Pass      |
| Peak Impactor Acceleration       | G's   | 38 to 47      | 44     | Pass      |
| Pelvis Y Acceleration after 6 ms | G's   | 34 to 42      | 40     | Pass      |
| Peak Acetabulum Force            | N     | 3600 to 4300  | 4161   | Pass      |
| Overall Test Results             |       |               |        | Pass      |

  
Laboratory Technician

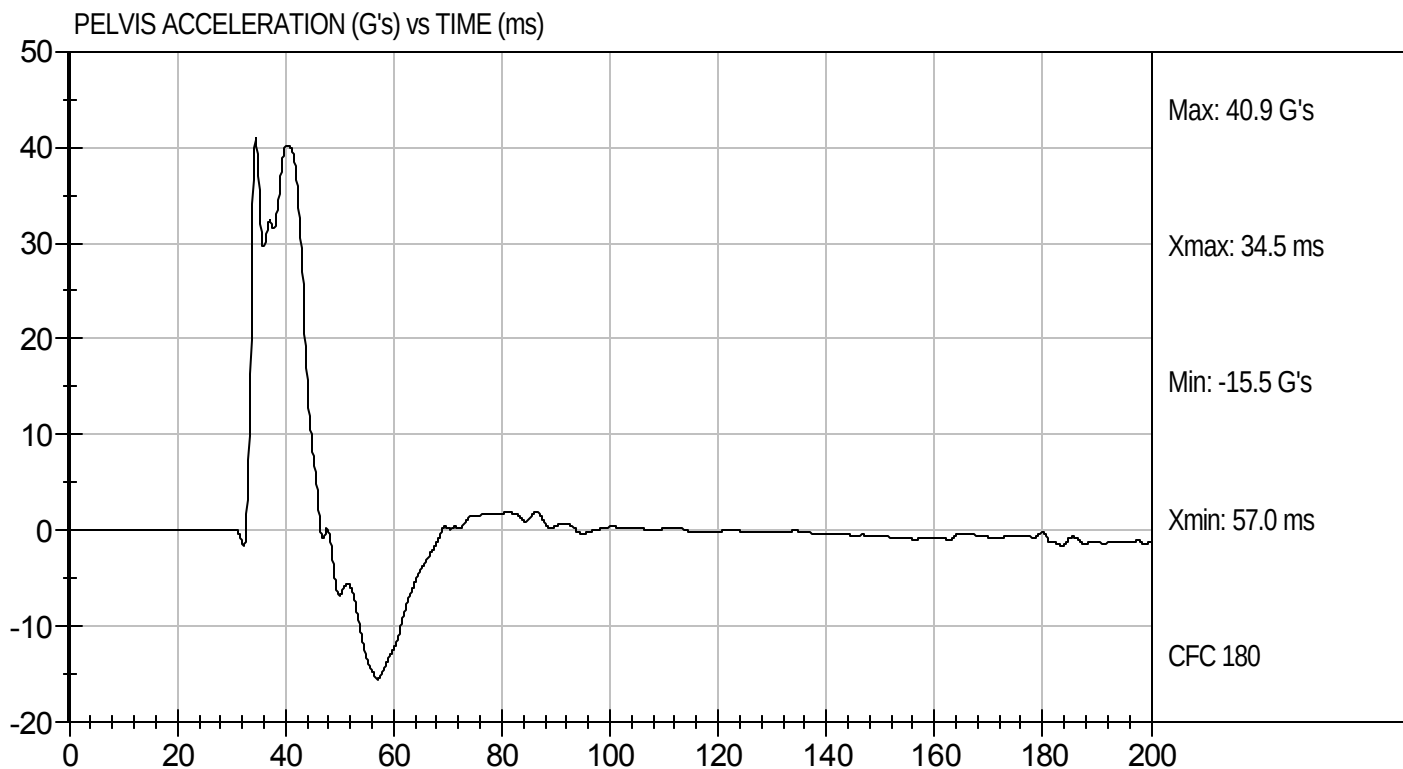
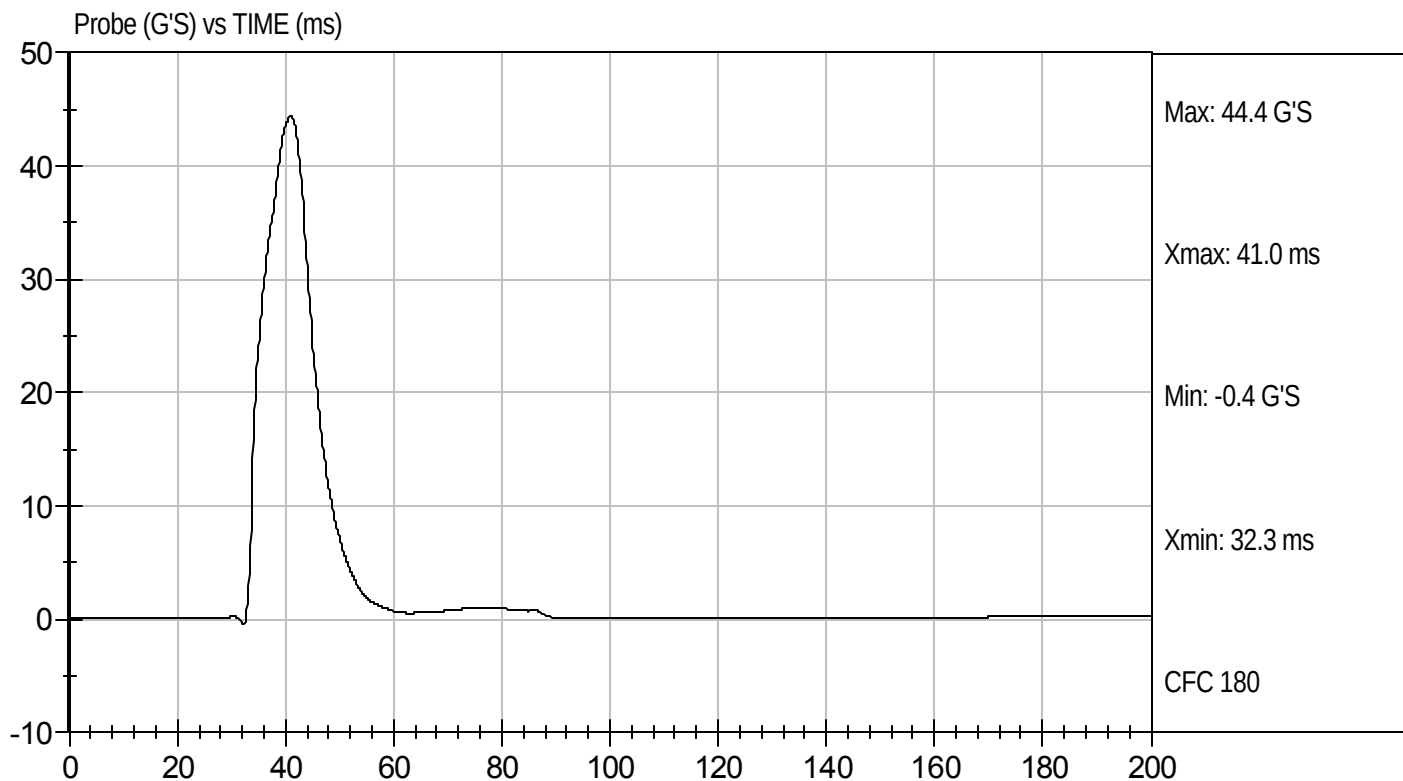
4/30/09  
Test Date

  
Approved By



Test Desc: Pelvis Impact  
Component ID: D091007

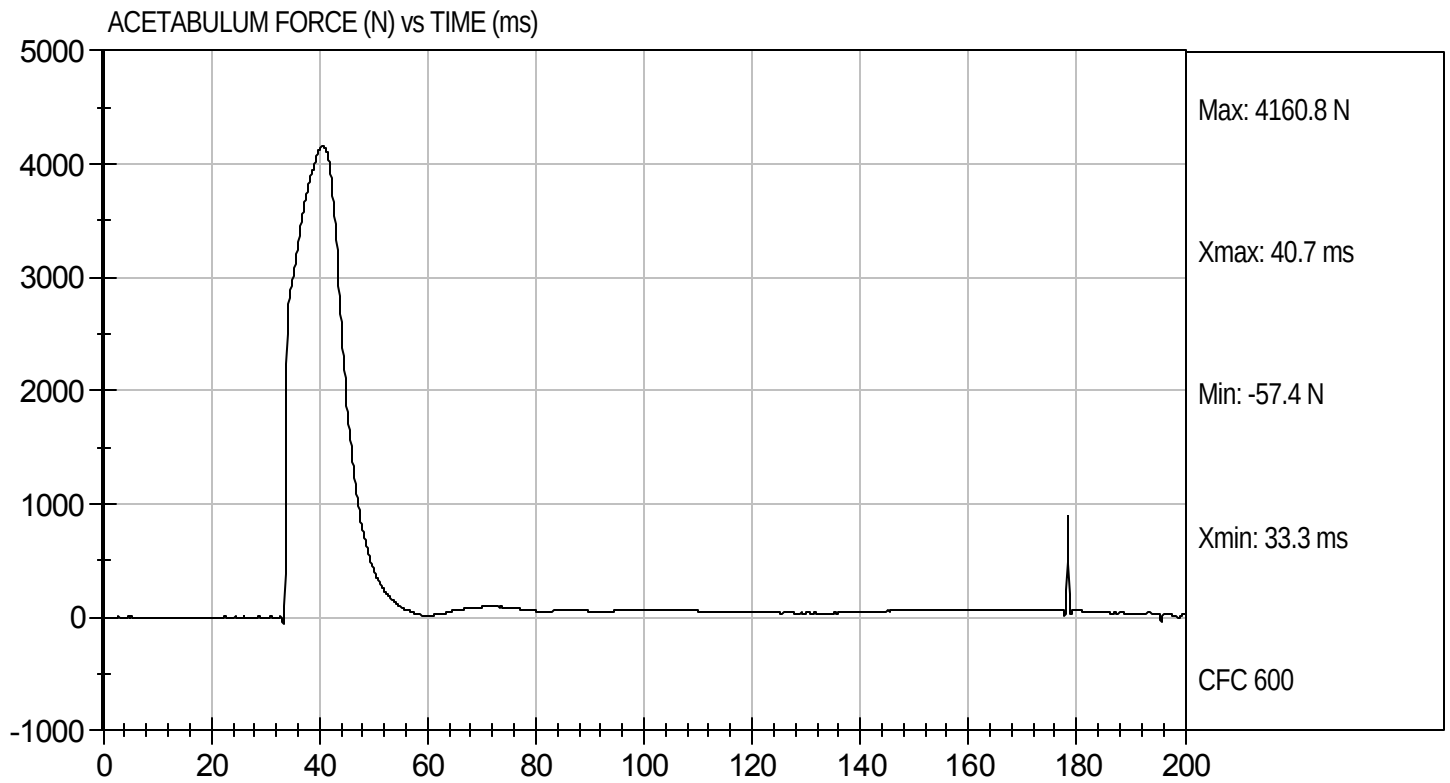
Test Date: 4/30/09  
Velocity: 22.22 ft/s, 6.77 m/s





Test Desc: Pelvis Impact  
Component ID: D091007

Test Date: 4/30/09  
Velocity: 22.22 ft/s, 6.77 m/s



**MGA RESEARCH CORPORATION**  
**ILIAC IMPACT TEST**  
**SID-IIs BUILD LEVEL D DUMMY**

**ATD Serial No:** 296

**Test I.D:** D091008

| Tested Parameter           | Units | Specification | Result | Pass/Fail |
|----------------------------|-------|---------------|--------|-----------|
| Temperature                | deg C | 20.6 to 22.2  | 21.4   | Pass      |
| Humidity                   | %     | 10 to 70      | 48     | Pass      |
| Impact Velocity            | m/s   | 4.20 to 4.40  | 4.30   | Pass      |
| Peak Impactor Acceleration | G's   | 36 to 45      | 40     | Pass      |
| Pelvis Y Acceleration      | G's   | 28 to 39      | 35     | Pass      |
| Peak Pelvis Iliac Force    | N     | 4100 to 5100  | 4804   | Pass      |
| Overall Test Results       |       |               |        | Pass      |

  
Laboratory Technician

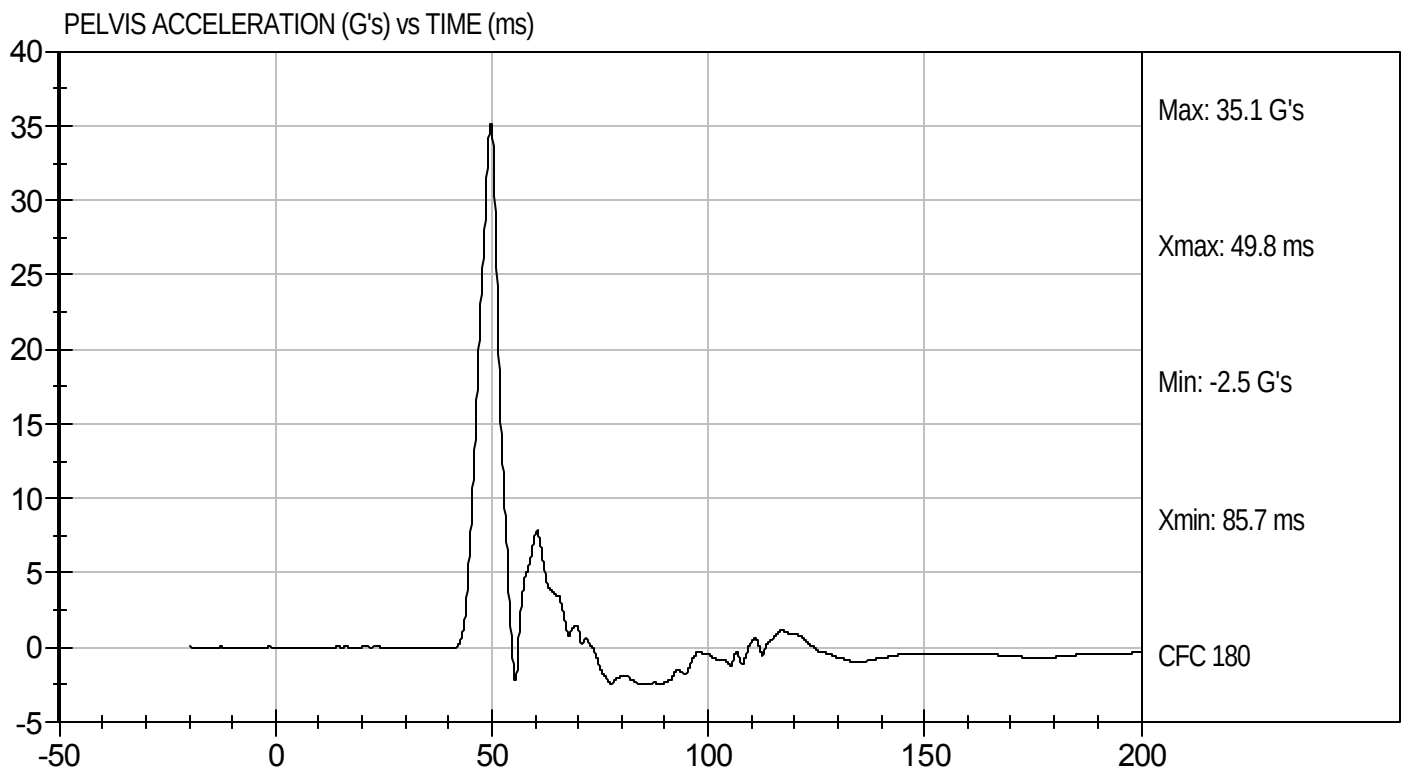
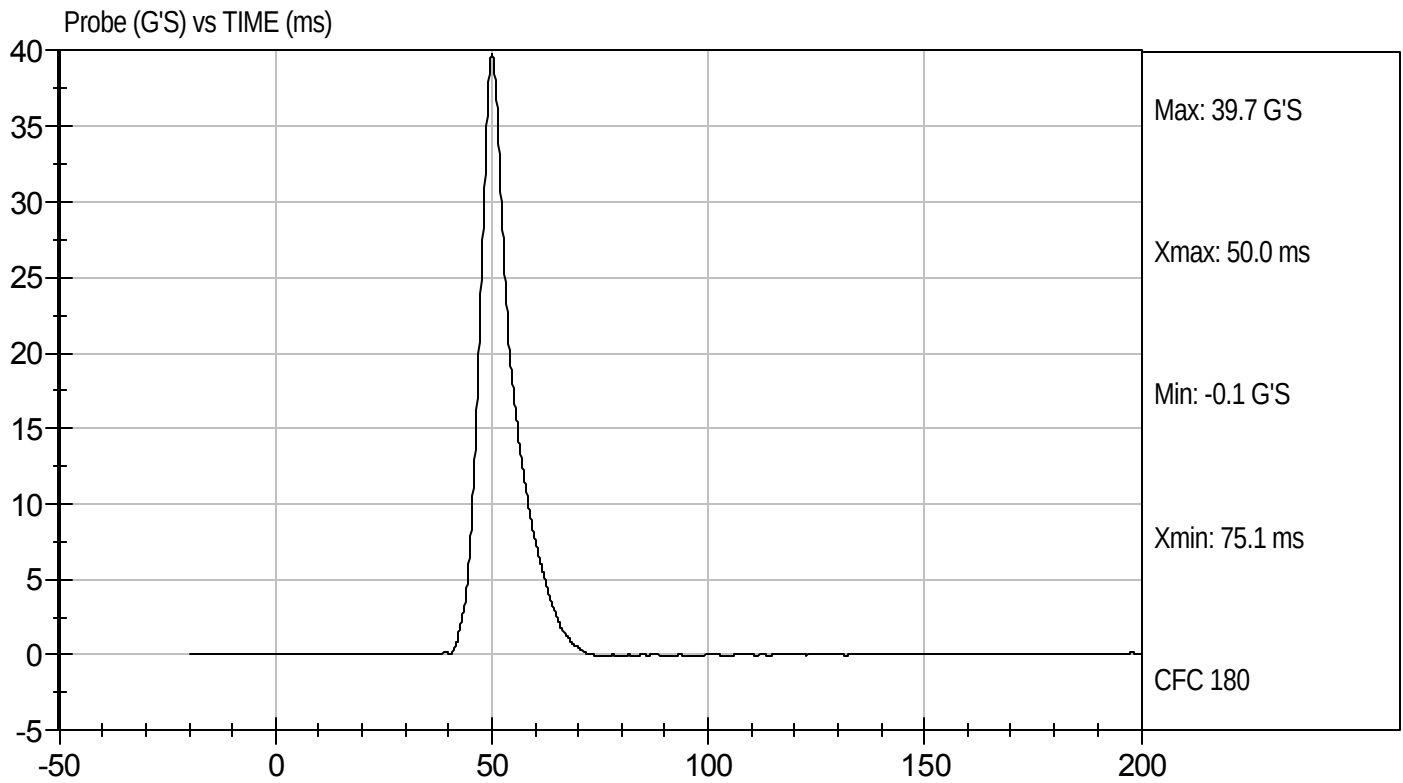
4/30/09  
Test Date

  
Approved By



Test Desc: Iliac Impact  
Component ID: D091008

Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.30 m/s





Test Desc: Iliac Impact  
Component ID: D091008

Test Date: 4/30/09  
Velocity: 14.12 ft/s, 4.30 m/s

